ENGINEERING NEWS-RECORD

Harvey O. Banks—California's pick for an $11.3-billion water plan p. 83

A McGRAW-HILL PUBLICATION

E B POWER
GS N
UNIVERSITY MICROFILMS IN
513 N 1 ST
ANN ARBOR MICH

An engineering fact...

WROUGHT IRON PIPE takes up to a 50% heavier coating of ZINC

Tests prove the iron silicate fibers which give wrought iron its unusually high resistance to corrosion are also responsible for the material's ability to accept a considerably thicker hot-dip zinc protective coating than steel.

Our bulletin, *Piping for Permanence*, discusses galvanic protection, and reviews a variety of wrought iron pipe services. Write for your copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Division Offices in Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. International Division: New York, N. Y.

Available in Canada and throughout the world

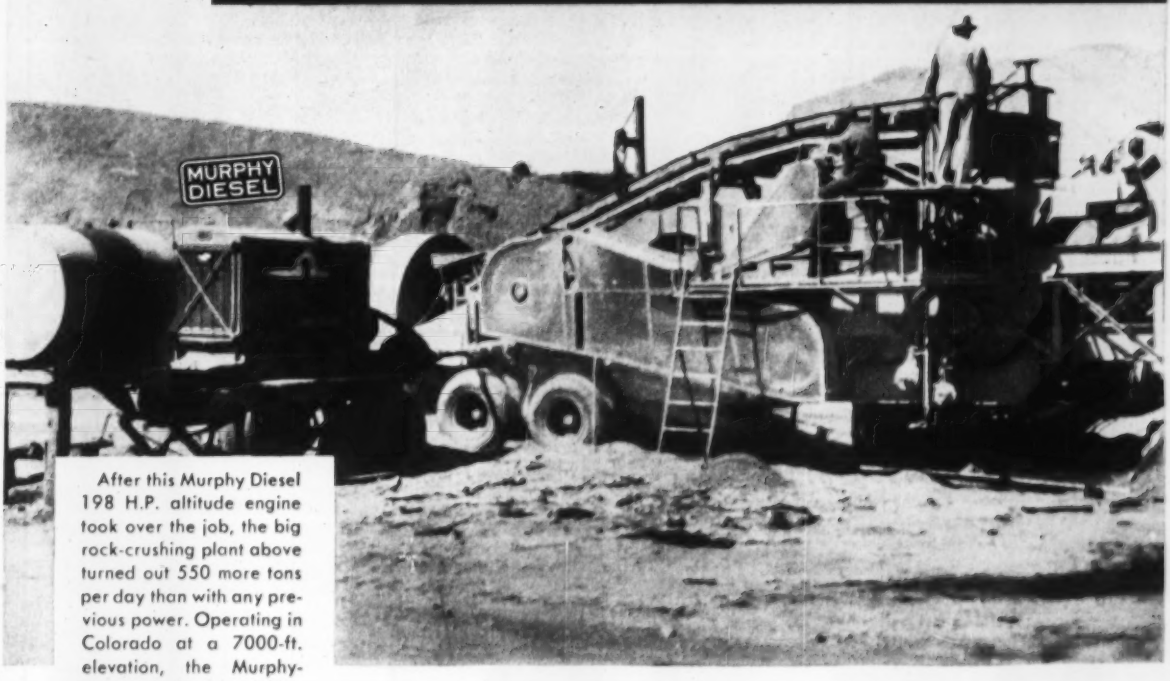
These photomicrographs illustrate the ability of wrought iron to receive a tighter, heavier zinc coating. Because the life of the coating is directly influenced by its adherence and weight or thickness, zinc coating on wrought iron lasts longer.

BYERS *Wrought Iron Tubular and Hot Rolled Products*

ALSO ELECTRIC FURNACE QUALITY STEEL PRODUCTS

550 more tons per day . . .
since they repowered with

MURPHY DIESEL



After this Murphy Diesel 198 H.P. altitude engine took over the job, the big rock-crushing plant above turned out 550 more tons per day than with any previous power. Operating in Colorado at a 7000-ft. elevation, the Murphy-powered plant is making extra profit for its owner.

• Profitable aggregate production depends on the power that drives your crushing plant. Take it from the owner of this Cedarapids Master Tandem who increased production *and profit* by repowering with a Murphy Diesel. Whether you're operating high in the Rockies, or deep in a quarry, take advantage of Murphy's greater fuel economy, longer trouble-free life, and dependability unmatched by any other engine of comparable size.

Ask producers who own Murphy Diesels to give you their opinion about the power that assures more profitable production from any plant—then ask your Murphy Diesel dealer to show you what a difference Murphy can make in your operations.

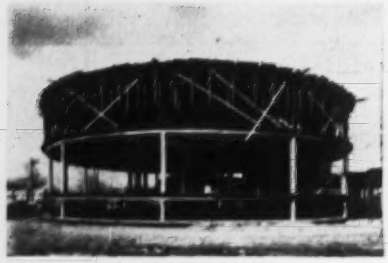
MURPHY DIESEL

HEAVY-DUTY POWER for Rock Crushing

Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

MURPHY DIESEL COMPANY
5321 W. Burnham St. • Milwaukee 14, Wis.

348-A



Addition to St. Patrick's High School, Chicago, Illinois; Wm. C. Kuhlmann Co., General Contractor.

Symons Safety Shores

Cut Costs on All Shoring Jobs

Symons Safety Shores keep all jobs moving on a dependable, time-saving, cost-cutting schedule. Their trouble-free performance is a matter of record. Here are 4 reasons why—

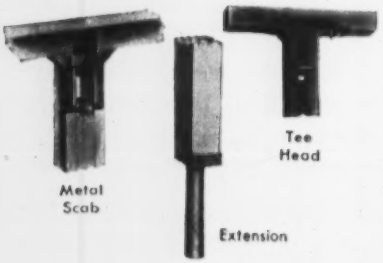
Safe-Way Bracing . . . easily secured at any point

Scab, Tee Head and Extension . . . enable shore to fill every shoring need

Workmen Prefer . . . handling this lighter, easily adjusted shore

Lifting Jack and Attached Wedge . . . make possible easy reshoring under heavy load

Use Symons Shores for those heavy load shoring jobs. There is no better way to make that tough job easy. Symons Clamp & Mfg. Co., 4265 Diversey Avenue, Dept. F-6, Chicago 39, Ill.



LARGE STOCKS OF SHORES AVAILABLE FOR RENTAL
RENTAL MAY APPLY ON PURCHASE—90 DAY OPTION

ENGINEERING NEWS-RECORD

EIGHTY-SECOND YEAR OF PUBLICATION

MEMBER

Editorial Offices, 330 W. 42nd St., New York 36, N. Y.
New York - LOngacre 4-3000; Chicago - MOhawk 4-5800; San Francisco - DOuglas 2-4600; Washington - REpublic 7-6630

Waldo G. Bowman, Editor

Highways, Airports—Transportation

Eugene E. Halmos, Jr., *Senior Editor*
John R. Owen, Barbara Lamb

Buildings, Bridges—Structures

Frederick S. Merritt, *Senior Editor*
Edward R. Wood, James B. Sullivan

Rivers, Sanitation—Water Use

Arthur J. Fox, Jr., *Senior Editor*
Howard Jacoby

Finance, Labor—Management

Clyde C. Henning, *Associate Editor*
Charles J. Harding, John Flanagan

Regional Editors

J. Roland Carr, *Chicago, 520 N. Michigan Ave.*
Laurence L. Wise, *San Francisco, 68 Post St.*

Copy, Presentation—Production

John J. Christie, *Senior Editor*
Stanley C. Jensen
Marcellino V. Leggiero
Harry W. Jensen, *Presentation*
Rachael Robinson, *Makeup*
John C. Greenough, *Printing*

Statistics, Prices, Costs—Business News

Elsie Eaves, *Manager*
Julia Mahoney, *Construction Reports*
Mildred Wetzel, Loretta Felix, Marion Sciorra, Florence Dembek
James Webber, *Economics*
Ruth I. Carlson, Marie Roessler, Evelyn Huber

Editorial Research and Indexing

Helen Rich
Eva Glerat, Rene Hay, Judith Feld
Patricia Witschger, Marianne Stern

Consulting Editors

Van Tuyl Boughton, *New York*
Nathan A. Bowers, *San Francisco*

Washington News Bureau, Room 1189 National Press Building; G. B. Bryant, Jr., *Manager*, Glen Bayless, A. E. Adams, Roy Calvin, Ernest Conine, John C. L. Donaldson, Jay Flocken, Boyd France, William Gilmour, Sam Justice, Arthur J. Kraft, D. O. Loomis, Gladys Montgomery, A. L. Moore, Seth Payne, M. A. Reichek, Caroline Robertson, V. B. Smith.

Domestic News Bureaus: Atlanta, 801 Rhodes-Haverty Bldg., Pat Henry; **Cleveland,** 1510 Hanna Bldg., R. A. Cockran; **Detroit,** 856 Penobscot Bldg., J. C. Jones Jr.; **Houston,** 1303 Prudential Bldg., J. A. Lee; **San Francisco,** 68 Post Street, M. C. Ralston; **Los Angeles,** 1125 W. Sixth St., John Shinn; **Seattle,** 6040 Fifth Ave., N.E., Ray Bloomberg.

Correspondents: Albany, Albuquerque, Augusta, Me., Austin, Boston, Boulder, Baltimore, Birmingham, Bismarck, Charleston (W. Va.), Charleston (S. C.), Columbus, Cincinnati, Cleveland, Chicago, Cheyenne, Dallas, Denver, Des Moines, Detroit, Durham, Harrisburg, Helena, Houston, Hartford, Indianapolis, Jackson, Miss., Jacksonville, Jefferson City, Kansas City, (Mo.), Lansing, Lincoln, Little Rock, Miami, Memphis, Minneapolis, Montgomery, Milwaukee, New Orleans, Norfolk, Omaha, Oklahoma City, Philadelphia, Pittsburgh, Portland (Ore.), Providence, Phoenix, Pierre, St. Louis, Schenectady, Springfield (Ill.), Syracuse, St. Paul, Seattle, Salt Lake City, Spokane, Topeka, Trenton, Wilmington. **Canada:** Montreal, Toronto, Ottawa, Victoria, Regina.

McGraw-Hill Economics Department: Dexter M. Keezer, director; W. H. Chartener

Foreign News Bureaus: Editor, John Wilhelm, **New York;** G. W. Schroder, **Bonn;** Sharokh Sabavala, **Bombay;** William J. Coughlin, **London;** John H. Kearney, **Mexico City;** John O. Coppock, **Paris;** Dan Kurzman, **Tokyo;** Peter Weaver, **Rio de Janeiro. Correspondents:** Amsterdam, Athens, Bangkok, Bogota, Brussels, Buenos Aires, Caracas, Copenhagen, Geneva, Havana, Helsinki, Johannesburg, Lima, Madrid, Melbourne, Oslo, Rome, Stockholm, Sydney, Tehran and 21 other principal cities and countries.

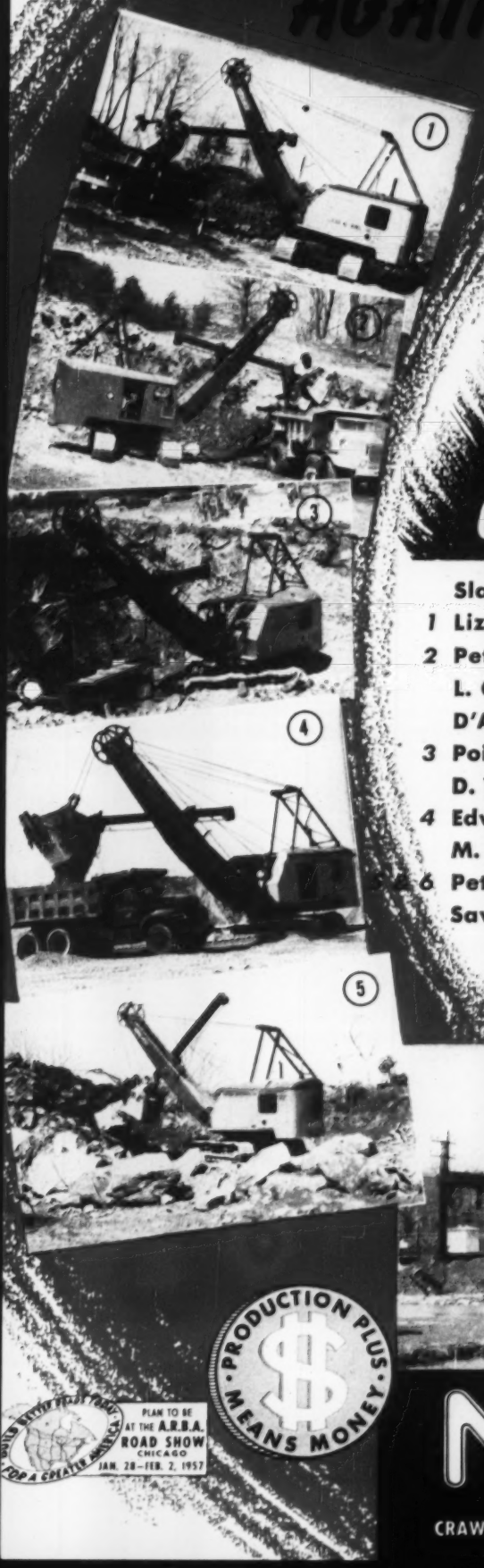
Robert F. Boger, Publisher

ENGINEERING NEWS-RECORD Vol. 156, No. 24, June 14, 1956

Published weekly by McGraw-Hill Publishing Company. James H. McGraw (1860-1948), Founder. **Executive, Editorial, Advertising and Subscription Offices, McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** Publication Office, 99-129 North Broadway, Albany 1, N. Y. Donald C. McGraw, President; Paul Montgomery, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Circulation Director. **SUBSCRIPTIONS:** Address correspondence to Engineering News-Record—Subscription Service, 99-129 North Broadway, Albany 1, N. Y., or 330 W. 42nd St., New York 36, N. Y. Allow one month for change of address. Subscriptions are solicited only from persons with an identifiable commercial or professional interest in construction and building. **Position and company connection must be indicated on subscription orders.** Single copies 35¢. Subscription rates: United States and possessions, $6.00 a year; $9.00 for two years; $12.00 for three years. Canada $8.00 a year; $12.00 for two years; $16.00 for three years. Other Western Hemisphere and the Philippines, $15.00 a year; $25.00 for two years; $30.00 for three years. All other countries $20.00 a year; $30.00 for two years; $40.00 for three years. Second class mail privileges authorized at Albany, New York. Printed in U. S. A.

Copyright 1956 by McGraw-Hill Publishing Co., Inc.—All Rights Reserved.

AGAIN NORTHWEST
Leads the way on another Turnpike!



41 Already NORTHWESTS on the Connecticut Turnpike!

	Slattery Contracting Co.	4 Northwests
1	Lizza & Sons, Inc.	3 Northwests
2	Peter W. Kero, Inc.	2 Northwests
	L. G. Defelice & Son	6 Northwests
	D'Addarrio Construction Co.	2 Northwests
3	Poirier & McLane Corp.	5 Northwests
	D. V. Frioni and Co., Inc.	5 Northwests
4	Edward J. Petrillo	5 Northwests
	M. A. Gamino Construction Co.	4 Northwests
6	Peter Mitchell, Inc.	4 Northwests
	Savin Construction Corporation	1 Northwest

NORTHWEST ENGINEERING COMPANY
1502 Field Building, 135 South LaSalle Street
Chicago 3, Illinois

580-10-1

OVER HALF THE SHOVEL EQUIPMENT ON THE WEST VIRGINIA TURNPIKE WAS NORTHWEST

WELL OVER 100 NORTHWESTS —MORE THAN ANY OTHER MAKE —ON THE NEW YORK THRUWAY

OVER 20 NORTHWESTS ON THE MAINE TURNPIKE EXTENSION

57 NORTHWESTS—MORE THAN ANY OTHER MAKE — ON THE MASSACHUSETTS TURNPIKE

OVER 60 NORTHWESTS—MORE THAN ANY OTHER MAKE—ON THE OHIO TURNPIKE

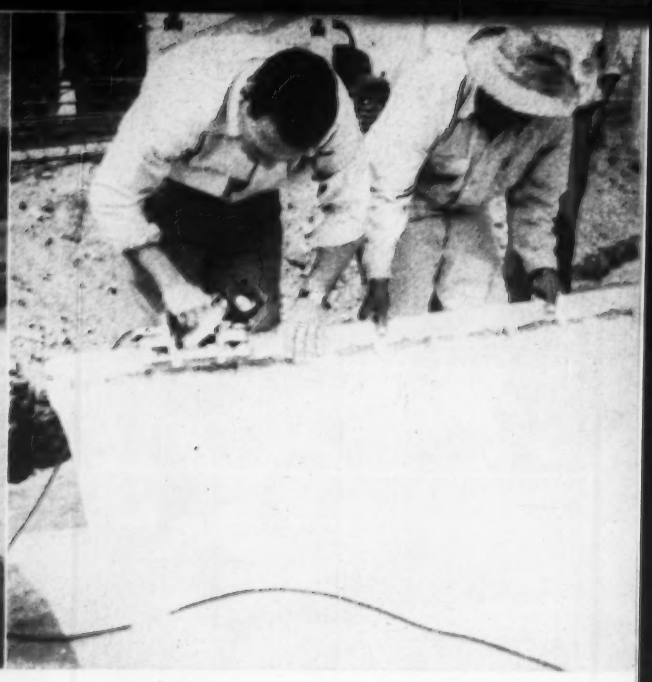
PRODUCTION PLUS · MEANS MONEY ·

FOR A GREATER AMERICA

PLAN TO BE AT THE A.R.B.A. ROAD SHOW CHICAGO JAN. 28—FEB. 2, 1957

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



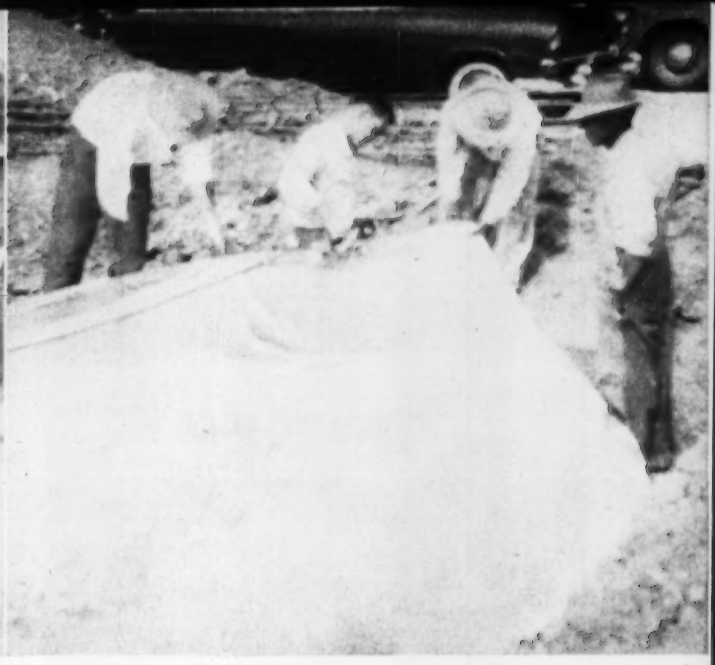
Ten thousand square feet to be covered with a polyethylene moisture barrier. The bed of sand has already been prepared as the film is laid out.

The first seam is started. A 6-inch overlap, taped or stapled is satisfactory.

The polyethylene film is pulled into position. Being tough and flexible, few men are needed to handle the light weight membrane.

Completely in place, steelwork is already being laid in preparation for pouring concrete for the slab.

Data courtesy of Wilson Lumber Co., San Antonio, Tex., distributors for "Visqueen Polyethylene Film" made by **The Visking Corporation,** Terre Haute, Ind.



Work moves fast with this simple electric sealer. Each 32-foot wide strip of polyethylene is joined to its neighbor.

The final seam is completed. Pipes and electrical outlets protrude through holes cut in the film. They are then wrapped tightly in small sheets of film and sealed with the main barrier.

Here's how it's done...

A lifetime moisture barrier in only 2¼ hours

Polyethylene moisture barriers are tough and long-lived . . . go in fast with a big saving.

Today, more and more architects and builders are turning to film made of BAKELITE Brand Polyethylene for a variety of moisture barrier applications. Polyethylene film is very light in weight, requiring fewer men for installation. Flexible in the most extreme cold, it is tough, unaffected by chemicals and easily sealed by heat, staples or tape. This application, developed by The Visking Corporation, is ideal for waterproofing almost everywhere . . . for protecting materials and equipment from weather . . . even for dustproofing in walls and subflooring.

Why not find out about using film made of BAKELITE Brand Polyethylene in your next building? Your building supply dealer has complete information, or write Dept. QE-49.

It pays to specify film made of

BAKELITE
BRAND
Polyethylene Plastic

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

World's best protection

TEXACO SIMPLIFIED LUBRICATION PLAN

Enables you to handle all major lubrication with *no more than six* Texaco Products. Your Texaco Lubrication Engineer will gladly show you how the Plan reduces lubricant inventory, saves time and money, and helps you avoid lubrication mistakes.

TUNE IN:
TEXACO STAR THEATER
starring
JIMMY DURANTE
on television . . .
Saturday nights, NBC.

TEXACO

TEXACO

against wear and rust

TEXACO MARFAK is the name. This famous chassis lubricant clings to metal and seals the working grease within the bearing. Heavy loads won't squeeze it out, rough roads won't jolt it out. Its persistent lubricating film fights wear and prevents rust. Parts last longer, maintenance costs come down.

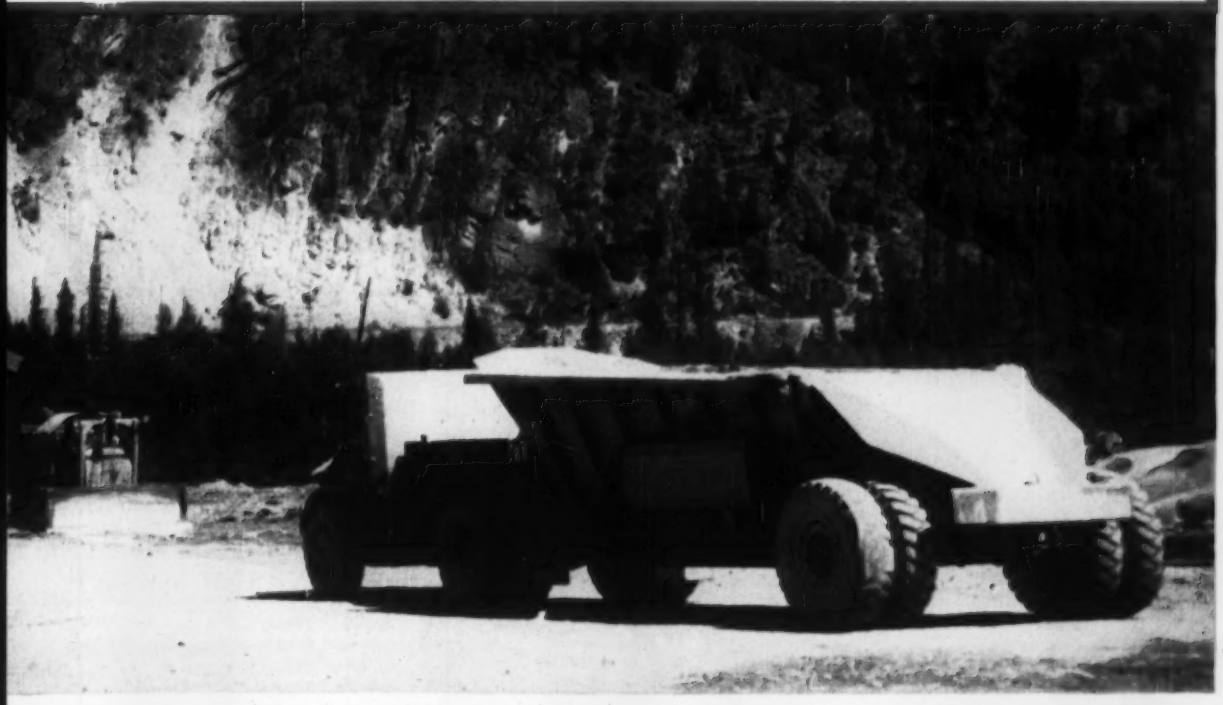
For wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in —assuring safer braking and extra thousands of miles between repackings. No seasonal change required.

For those who want a multi-purpose lubricant, *Texaco Marfak Heavy Duty Special 2* is the new, lithium-base grease that can be used for chassis, wheel bearings, water pumps and other bearing lubrication.

MORE THAN 625 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD

For crawler mechanisms, use *Texaco Track Roll Lubricant*. It protects against wear and rust, prolongs roll life. For transmissions and differentials, use *Texaco Universal Gear Lubricant EP*—assure smoother performance, lower maintenance costs.

Let a Texaco Lubrication Engineer help you keep work on schedule through effective lubrication. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



Lubricants and Fuels

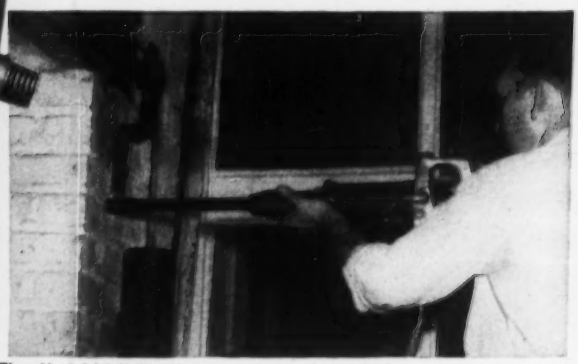
FOR ALL CONTRACTORS' EQUIPMENT

One tool does what four did before!

NEW THOR UTILITY AIR HAMMER

Swivel hose connection
Free swiveling air connection keeps hose from kinking.
Easy lubrication
Oversize oil reservoir can be filled without using a wrench.
Thor exclusive stop rotation
Instant conversion with the flick of this handy cam lever.
Weight only 14 LBS.

Thor exclusive stop rotation gives you a light demolition tool, a drill, a light clay digger, a chipping hammer—all in one compact tool.



Thor Model 15 Utility Hammer converts instantly from a self-rotating rock drill to a non-rotating hammer with a flick of an external cam lever.

NOW THOR offers a better all-purpose tool—a tool which drills, chips or breaks concrete and masonry. Only the compact Thor Model 15 Utility Hammer has instant stop rotation.

The Thor Model 15 Utility Hammer is easy to handle, easy to use and mighty easy on air. Try this amazing new tool. Any Thor distributor will be glad to give you a demonstration. Thor Power Tool Company, Aurora, Illinois.

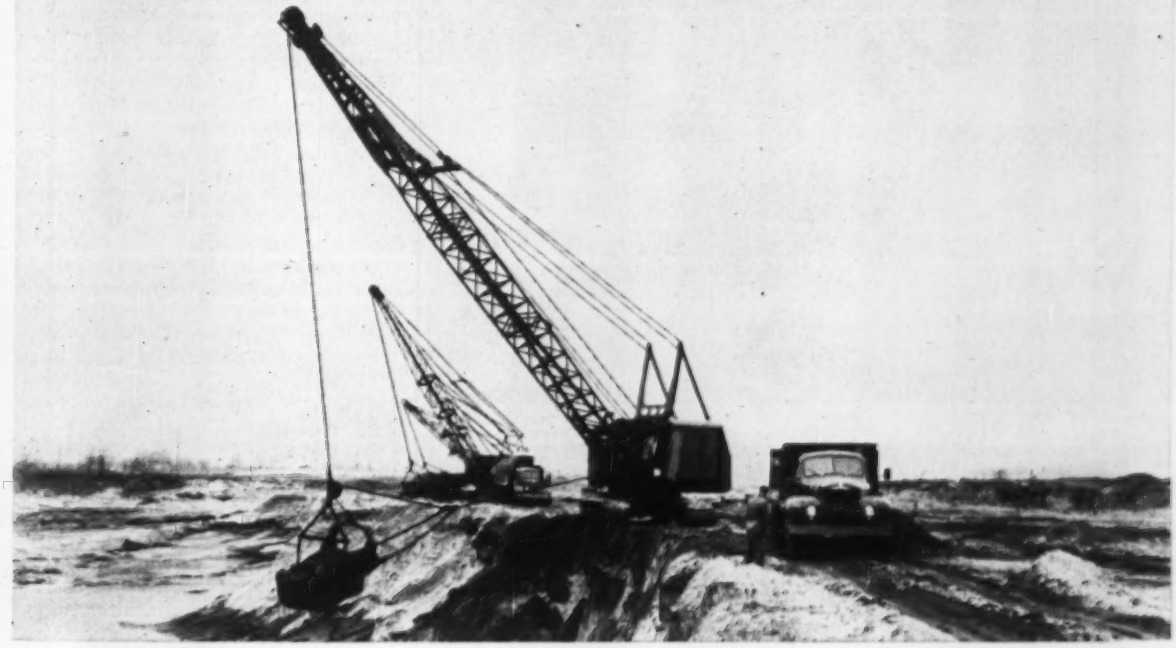
Thor
PORTABLE POWER TOOLS

THOR POWER TOOL COMPANY

Atlanta • Birmingham • Boston
Buffalo • Chicago • Cincinnati
Cleveland • Denver • Detroit
Houston • Los Angeles • Milwaukee
Newark • Long Island City, N.Y.
Philadelphia • Pittsburgh • St. Louis
San Francisco • Seattle
Toronto, Canada • Export Division, New York City

an ACCO product

American Cable TRU-LAY VHS | 15% STRONGER



New VHS Dragline Gives 33% More Wear

Mr. W. D. Tierney, of Tierney Bros., Contractors of Lockport, Illinois, says: "The draglines on our 3500 Manitowoc lead a rough life. Therefore, when our distributor told us about the possibility of increased service with new TRU-LAY VHS draglines we decided to give it a chance.

This new dragline lived up to all the claims made for it. It lasted over four months under a variety of operating conditions—working in sand, gravel, earth and slag. We estimate that we got at least one-third more service from this dragline than we had been able to obtain before. And we particularly like the pre-lubricated feature."

VHS draglines are setting records like these on construction projects all over the country. They are made from a new grade of steel for wire rope—and are at least 15% stronger than Improved Plow Steel—the best grade available until now.

For Heavier Loads, Higher Safety Factor

TRU-LAY VHS's extra strength enables you to handle heavier loads with the same diameter line. And it gives a higher factor of safety for the entire service life of the rope.

For Shovel Hoist Ropes and Scraper Cables Too

TRU-LAY VHS was developed especially for the toughest applications in the construction field—draglines, shovel hoist ropes and scraper cables. In addition to greater strength, it is also tougher—more wear resistant. And it has all the advantages of preformed construction. This means that it lasts longer in the roughest construction services.

Cuts Down Time—Saves Money

Because it is tougher and more wear resistant, TRU-LAY VHS rope lasts longer, costs less to use and cuts "down time" of equipment for wire rope replacement.

TRU-LAY VHS ropes are easy to order. Just ask for TRU-LAY VHS Shovel Hoist Ropes, Scraper Ropes or draglines, in the size you want. You don't need any complicated specifications.

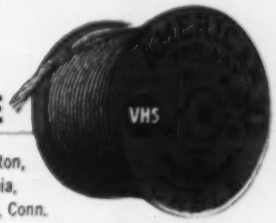
Your American Cable Distributor has TRU-LAY VHS *in stock now. See him or write to the nearest American Chain & Cable Company Office.*

ACCO

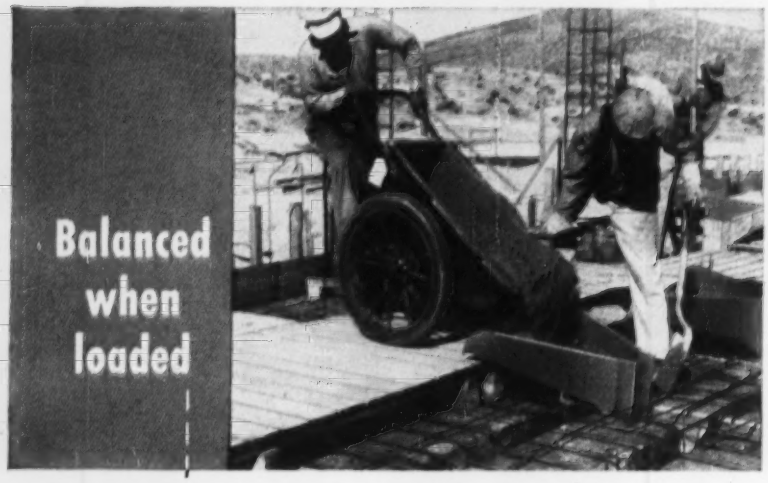
American Cable Division

AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.



GAR-BRO CONCRETE CARTS
INSURE *Full Capacity* LOADS



HANDLES 30% MORE load with half the effort.

LIGHTWEIGHT—¼ to ⅓ lighter than ordinary carts.

ROCKER DUMP type carts are available for handling dry concrete.

HIGH TRAY permits hauling lumber, forms and other materials.

THREE MODELS: Narrow 30" width, 6 cu. ft. cart for easy handling and narrow runways. Standard 35" width, 6 to 8 cu. ft. carts. See your Gar-Bro dealer.

GAR-BRO MANUFACTURING CO • Los Angeles, Calif. • Peoria, Ill.
General Offices: 2415 E. Washington Blvd., Los Angeles 21, California

Ask your dealer for the Gar-Bro Manual . . .

GAR-BRO *the world's most complete line of*
Concrete Handling Equipment

McGraw-Hill Mailing Lists Will Help You

- Merchandise your advertising
- Conduct surveys
- Get inquiries and leads for your salesmen
- Pin-point geographical or functional groups
- Sell Direct
- Build up weak territories
- Aid Dealer relations

Direct Mail is a necessary supplement to a well rounded Business Paper advertising program. Most progressive companies allocate a portion of their ad budgets to this second medium at the same time as they concentrate on the best business publications. 600,000 of the top buying influences in the fields covered by the McGraw-Hill publications make up our 150 mailing lists. Pick Your prospects out of our Industrial Direct Mail catalogue.

Write for your free copy of our Industrial Direct Mail catalogue with complete information.

Reader Comment

Pile Length Can Be Figured

SIR—We wish to comment on the opening statement of your article, "Tests Tell H-Pile Story" (ENR Apr. 5, p. 90): "Foundation engineers may be able some day to sit in the comfort of their offices and determine friction pile lengths—no bearing tests in the field will be necessary."

The predetermination of pile lengths from soil data is not new but has been common practice with several consulting firms for a period of many years. As an example, the firm of Dames & Moore has followed a procedure of predetermining pile lengths for more than 15 years. This procedure is described in "Experiences with Predetermining Pile Lengths," by William W. Moore, PROCEEDINGS of the American Society of Civil Engineers, Nov., 1947. These determinations have been used to provide foundation designs for hundreds of engineering projects for a wide variety of soil conditions and pile types.

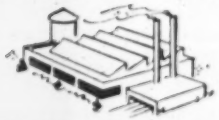
The method used by Dames & Moore to analyze pile capacities is quite similar to the procedure used by the Armour Research Foundation. This method is roughly as follows:

- Test borings are drilled under the supervision of trained engineers. Core samples of the subsoils are taken for laboratory testing.
- Strengths of subsoils are evaluated by performing laboratory shear tests under loadings that approximate conditions expected in the field.
- Based on the soil conditions and structural requirements, the most suitable alternate types of piles are selected for comparison. The support which can be obtained for different pile lengths is then analyzed from the standpoint of the minimum soil strength which will be mobilized on the sides and ends of the piles. The methods of analysis vary somewhat for different pile types and soil conditions. As an example, piles driven into clay soils are analyzed in a different manner than piles driven into sandy soils.

(Continued on page 12)

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

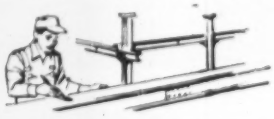


PROVED THROUGHOUT INDUSTRY FOR OVER THIRTY YEARS

Industrial leaders all over the world have used Rust-Oleum to stop and prevent rust for over thirty years. Rust-Oleum can do the same for your tanks, stacks, pipes, machinery, metal sash, wire fences, girders, etc.

RUST-OLEUM IS EXCLUSIVE

Rust-Oleum uses a specially-processed fish oil vehicle that penetrates rust to bare metal, dries right, and is free from objectionable odor. Accept no substitutes. Buy—and specify Rust-Oleum. You'll be happy that you did. There is only one Rust-Oleum—it is distinctive as your own fingerprint.



APPLY DIRECTLY OVER RUSTED SURFACES

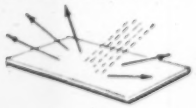
Just scrape and wirebrush to remove rust scale and loose rust—then brush Rust-Oleum 769 Damp-Proof Red Primer right over the remaining rust, usually eliminating costly surface preparations. Then—follow-up with your desired Rust-Oleum finish color.

MANY COLORS, INCLUDING ALUMINUM AND WHITE

You beautify as you protect, because Rust-Oleum finish coatings are available in practically all colors, including aluminum and white. They use the same basic rust-inhibiting vehicle as Rust-Oleum 769 Damp-Proof Red Primer and so provide double protection.

GREATER COVERAGE—EASY TO USE

Rust-Oleum is so easy to apply by brush or spray that one man can often do the work of two. Because of Rust-Oleum's easy-flowing qualities, an average of 30% more coverage is usually received—depending upon the type and porosity of the surface.



PRACTICAL ANSWER TO YOUR RUST-PRODUCING CONDITIONS

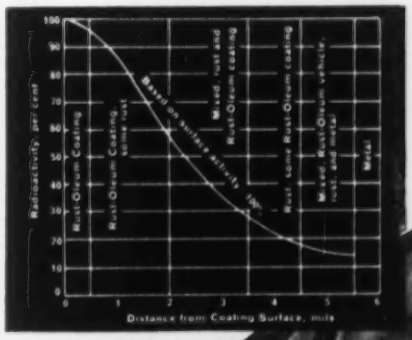
Rust-Oleum dries to a firm, decorative finish that resists salt water, heat, fumes, sun, steam, humidity, and weathering. Whatever your rust problem—you'll find Rust-Oleum the modern, practical way to stop rust.

Facts

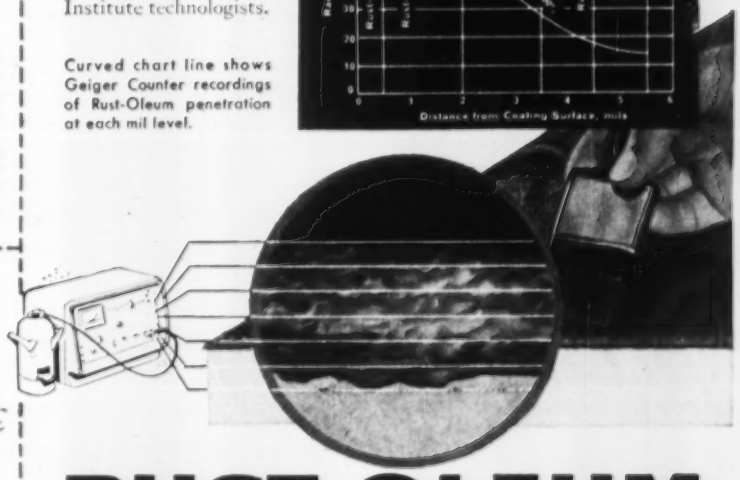
prove the economy of

RUST-OLEUM®

Geiger Counter traces Rust-Oleum penetration through rust to bare metal. The results of radioactive research prove that Rust-Oleum penetrates rust to bare metal. Rust-Oleum's *specially-processed* fish oil vehicle was radioactivated and formulated into Rust-Oleum 769 Damp-Proof Red Primer—then applied to rusted test panels. Geiger Counters then traced Rust-Oleum's *specially-processed* fish oil vehicle through the rust to bare metal. This penetration enables Rust-Oleum to be applied directly over sound rusted surfaces—usually eliminating costly surface preparations. Attach coupon to your business letterhead for your thirty-page report, "The Development of a Method To Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust On Steel Specimens," prepared by Battelle Memorial Institute technologists.


Radioactivity per cent
Distance from Coating Surface, mils
Rust-Oleum Coating
Rust-Oleum Coating some rust
Mixed rust and Rust-Oleum coating
Rust some Rust-Oleum coating
Mixed Rust-Oleum vehicle, rust and metal
Metal
Rust-Oleum vehicle penetrates rust to metal

Curved chart line shows Geiger Counter recordings of Rust-Oleum penetration at each mil level.



RUST-OLEUM®

STOPS RUST!

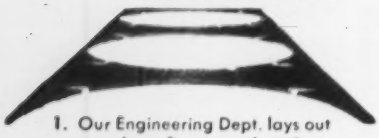
See our Catalog in SWEETS, or write for complete information. Prompt delivery from Industrial Distributor stocks.

ATTACH TO YOUR LETTERHEAD—MAIL TODAY!

Rust-Oleum Corporation
2697 Oakton St.,
Evanston, Illinois

- ☐ Complete literature with color charts.
- ☐ Thirty-page report on Rust-Oleum penetration.
- ☐ Nearest source of supply.

BECAUSE THEY FIT PERFECTLY!



1. Our Engineering Dept. lays out complete flooring plan from your floor plan, sketch or overall dimensions.
2. A shop drawing showing layout of sizes, shape and cut-outs for obstructions is submitted for approval before fabrication.

3. Each panel is carefully checked by our inspectors before shipment and is clearly marked for quick installation.
4. We furnish erection drawings showing location of marked panels.

These are only a few of the services that insure perfect fit when you specify IRVING GRATING.

•

Pioneers of the Grating Industry

•

Ask for Illustrated Catalog

IRVING SUBWAY GRATING CO., INC.
ESTABLISHED 1902

OFFICES and PLANTS at
5063 27th St., Long Island City 1, N. Y.
1863 10th St., Oakland 20, California

• Since the permissible settlements of the pile clusters may impose a more severe restriction than the load-carrying capacities of the piling, the expected settlement behavior is calculated for various lengths of piles. Frequently a moderate increase in length of a friction pile can result in substantially smaller settlements, but in other cases the settlements are reduced very little.

On about 100 occasions, it has been possible to check our analyses with pile load tests similar to those conducted by the Armour Research Foundation. Where strain gages have been installed on the piles, the measured load transfer has shown rather good agreement with what had been predicted.

It is now our conviction that the capacities of driven piles or drilled-cast-in-place piles can be predetermined with a fairly high degree of accuracy. On the majority of our investigations, where piles have been required, the piles have been installed to the lengths specified by us, without load testing and without confirmation by counting hammer blows.

The studies performed by the Armour Research Foundation confirm our experience in several important respects.

• The existing formulas for determining pile capacities based on the driving resistances can frequently give a very inaccurate indication of the actual supporting capacities of the piling. In the majority of cases we have studied, the use of "dynamic" pile formulas will result in piles that are considerably longer than required. However, there have also been many cases where foundation failures might have resulted if the driving resistances had been used to determine pile lengths.

• Even when piles are driven to practical "refusal" in firm soils, only a small portion of the applied load may reach the pile tips. We have noticed this interesting relationship with piles driven to "refusal" in sand. It seems quite possible that the true "end-bearing" pile may exist only where piles are driven to hard rock or extremely dense gravel.

The study made by the Armour Research Foundation is a very valuable addition to the knowledge of pile foundations. However, the findings are not new in principle and appear to confirm the present design practices of many consulting foundation engineers.

DON V. ROBERTS
Quality Improvement Engineer
Dames & Moore
Los Angeles, Calif.

Economic Nostalgia

SIR—If I correctly recall my American history, the letter from R. I. Hodgins (ENR, May 17) restates the economic philosophy advocated by William McKinley in the presidential campaign of 1896—good old 100% American, rugged-individualistic free enterprise. After denouncing government power projects, and federal aid to highway and school-building programs with the mangled scare-word, "socialism" he asks, "Is this (government spending) fair to our youngsters who will probably bear the brunt of the costs of a boom America?"

Assuming that he is aware of the tremendous overcrowding in the nation's classrooms, I would ask Mr. Hodgins if he thinks it fair to our youngsters to deprive them of adequate school plant facilities. Also assuming that he admits the importance of this education problem, I challenge him to propose an alternative to the program contained in the federal school aid bill. Private enterprise has an important role to play in this program but obviously cannot provide the initial impetus.

It is rather pathetic to see so many engineers who take pride in their alleged clear thinking still preaching the glories of a worn-out economic philosophy. In nineteenth-century America, laissez-faire doctrine was at least rational; today it is a superstitious mysticism, defended not by argument but by slogans and scare-words. As leaders in technological progress we engineers cannot be nostalgic reactionaries in economics.

C. W. GRIFFIN
Earlton, N. J.

Error of Omission

SIR—In ENR May 10, p. 83 there appears a very good analysis of the Priest Rapids project bids; however, the J. T. M. Constructors, Charlotte, N. C., were not all named.

Macco Corp., 14409 S. Paramount Blvd., Paramount, Calif. (John MacLeod, president), the "M" part of the name, was omitted in the article.

J. M. SAWYER
Macco Corporation
Paramount, Calif.

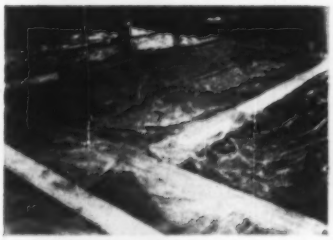
CALENDAR

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., June 17-22.

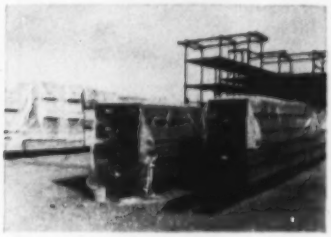
American Society of Landscape Architects, 57th annual meeting, Cleveland Hotel, Cleveland, Ohio, June 24-27.

Light, easy-to-handle, Olin Polyethylene makes a permanent moisture barrier when used in slab, full cellar or crawl space construction. Extra wide roll widths make the job that much easier.

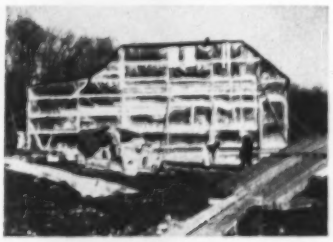
It costs you less to build better with Olin Polyethylene



Curing with Olin Polyethylene is easier and faster. The time and effort usually needed for extra wetting can now be eliminated—moisture is locked in.



Olin Polyethylene protects machines and materials even over long periods of bad weather. "See-through" quality makes equipment or supplies easy to find.



The work goes on at top efficiency even in bad weather when you close in with Olin Polyethylene.

Olin POLYETHYLENE

OLIN MATHIESON CHEMICAL CORPORATION

Whether it's used as a moisture barrier, protective cover, curing blanket, or closing-in material, Olin Polyethylene will usually save you time, labor and do the job better.

Unaffected by most acids, alkalies, bacteria, mold and temperature changes, Olin Polyethylene is a *permanent* moisture, vapor and draft barrier. Discover for yourself how much better, faster and more economically you can build with Olin Polyethylene. Olin Film Division, 655 Madison Avenue, New York 21, New York.

Write in for details!

OLIN FILM DIVISION
655 MADISON AVENUE
NEW YORK 21, NEW YORK

Please send me full information on Olin Polyethylene, and the name of my local dealer.

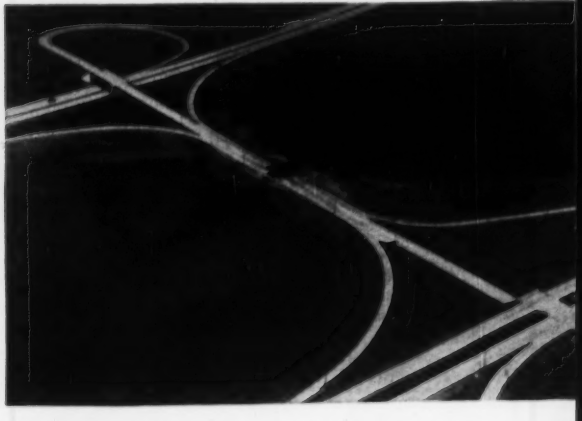
name_____ title_____

company_____

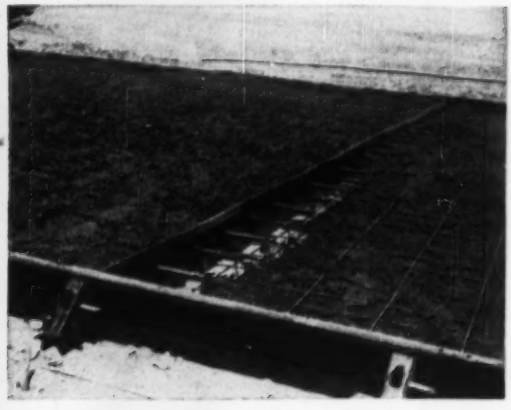
address_____

EDSEL FORD EXPRESSWAY
JOHN LODGE EXPRESSWAY

PENNSYLVANIA TURNPIKE



OHIO TURNPIKE



with AMERICAN WELDED WIRE FABRIC

EASY TO INSTALL. American Welded Wire Fabric comes in prefabricated sheets that can be placed quickly with minimum crews. It stays in place during pouring.

LOW COST. American Welded Wire Fabric has high-strength steel wire, electrically welded together for positive anchorage. The concrete slab is effectively reinforced with less steel than other types of reinforcement; so you have less steel to buy and less to handle. American Welded Wire Fabric keeps down maintenance costs, too, because it prevents destructive cracking, keeps roads smooth and safe.

VERSATILE. American Welded Wire Fabric comes in wide sheets for continuously reinforced concrete pavements in wire sizes up to and including ½″ in diameter, at 2″, 3″, 4″, and 6″ on centers. The use of American Welded Wire Fabric increases the strength of the concrete slab by 30% over that of non-reinforced concrete.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

Every type of reinforced concrete construction needs

USS American Welded Wire Fabric

UNITED STATES STEEL USS

American Steel & Wire
Room A-66, Rockefeller Bldg.
Cleveland 13, Ohio

Please send complete information on the following products:

- ☐ American Welded Wire Fabric for Portland Cement Concrete
- ☐ American Welded Wire Fabric for Asphaltic Concrete
- ☐ American Welded Wire Fabric for Airport Runways
- ☐ American Road Joints
- ☐ Multisafty Highway Cable Guard
- ☐ American Beam-type Highway Guard
- ☐ American Wire and Strand for Prestressed Concrete

Name .....

Firm .....

Address .....

City ..... State .....

here's what our service offers you

"The complete dependability of your reinforcing steel deliveries is an important factor." Contractors who have completed jobs on or ahead of schedule tell us this repeatedly. They have found that our unequalled re-bar stocks and service facilities enable us to meet any schedule—without fail—make it easy for us to step up deliveries when job requirements change. Ryerson re-bars are accurately cut and bent; permanently identified for easy placement. On your next contract, let us quote our lump sum or average pound price, so you can find out for yourself about dependable Ryerson re-bar service.

in stock

Re-bars & Accessories
Spirals, Wire Mesh
Open Web Joists
Caisson Rings
Expanded Metal
Grating, Treads,
4-WAY Safety Plate,
Structurals, etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

ENGINEERING NEWS-RECORD

Vol. 156, No. 24 June 14, 1956

Number of copies printed this issue: 73,329

CONTENTS

NATIONAL AFFAIRS

ASCE's Effect on Engineer Salaries 21
Arch Dams Future Bright 22
Progress Report: Construction and the 84th Congress 24
Costly Slide at Oahe Dam 25
Tilted Garage Straightened 26
Tremor Triggers Niagara Rock Slide 27
Ohio Is Winning Pollution Battle 28
Urge Postponement of Ohio Turnpike No. 2 28
New England Bay Cleanup Begins 33
Second Kaplan Installed at Gavins Point 34

FEATURES

World's First Tidal Power Plant 36
Pretensioning With Deflected Strands 45
Water Supply for Thule 53
Welded Garage Has Treelike Columns 57

NEW PRODUCTS

Backhoe Made to Match Tractor 63
New Line Single-Deck Walking Dragline 63
Big Rectifier Saves Space 63
Low Cost, Easy to Install Aluminum Window Frames 64
Torque Converter Drive Applied to Prime Mover 64
Friction-Type Swing Brake for Shovel Crane 69

INTERNATIONAL

Hanabanilla: Cuba's Hydro Project 73

MEN AND JOBS

California Fills a Prize Engineering Post 83
Corps of Engineers District Engineer Named 88
Chief Appointed for Sanitary Engineering Section, MSC 88

BUSINESS AND FINANCE

Plant Outlays Due to Climb 135
State Groups Finance Toll Bridge 135
Commercial Building Setting a Record 136
Underground Manufacturing Plant to Be Built 136
Cement Supply—Some Cities Short, Others Getting Tighter 139
California Voters Approve $40-Million School Bonds 139

LABOR

Push Settlement of Industrial Union Dispute 140
Wage Talks Hold Firm as Rates Go Up 140
GAW: Dual Payments Still a Stumbling Block 142
Another Ruling on Right-to-Work Laws 142
Construction Work Resumes at Hanford Atomic Project 145
Prevailing Wage Question Arises on Ohio Road Work 145

Reader Comment 10
Calendar 12
Washington Observer 19
Unit Prices 95
Editorials 158
Materials Prices 96
Construction Reports 98
Construction Scoreboard 131
Activity This Week 131

Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 45¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

CRANE QUIVERS—New York City's building contractors got a real scare last week, when they managed to stop—but just barely—a city order that would have barred use of cranes for any type of construction on Manhattan Island. Borough officials, exasperated by flagrant instances of cranes being permitted to tie up traffic and block streets, had their crack-down order ready to issue but yielded to a last-minute plea. It was decided to give the contractors a chance to come up with recommendations for a new set of rules and a system of self-policing.

CONCRETE PALACE—The American Concrete Institute's proposed new headquarters building, which is being designed by Monoru Yamasaki, will make spectacular use of concrete-folded plate roof, walls of precast concrete panels and colored concrete pipe. Slated for construction in early '57, the $275,000 showplace for the concrete industry's technological developments will be located in a Detroit residential area.

ALL IS FORGIVEN—A couple of years ago Elyria, Ohio, was kicking up a celebrated fuss over the fact that it was to be in the path of the Ohio Turnpike. Undeveloped areas bordering the superhighway were confidently predicted to become "blight" zones. What is happening in these areas today occasions a little embarrassment to some of Elyria's civil leaders but it's worth noting for the benefit of other communities suffering the same misgivings: Choice residential developments are springing up in areas adjacent to the turnpike—thus far to the tune of $8.5 million.

BID PRACTICES UNDER FIRE—The Pennsylvania Turnpike Commission's practice of placing maintenance contracts without advertising for bids is under investigation by the state attorney general's office. Claiming that it is up against a time factor in re-paving some 40 mi of asphalt roadway before cold weather sets in, the commission in recent weeks has let over $2 million in contracts on the basis of "letter bids" from contractors invited to submit their best offers. Indications are that the state administration will force the commission to adhere to a provision of the state administrative code, requiring that bids be advertised on all construction in excess of $4,000 for which state labor is not employed.

CLAY PRODUCTS RULING—A new Federal Trade Commission ruling specifies that products cannot be advertised as "brick" or "structural tile" unless they (1) are made primarily of clay or shale or a mixture of both and (2) are manufactured by application of heat. Products such as "concrete" brick or "concrete" tile must be designated by the proper adjectives to avoid charges of unfair trade practices.

OLD EARTH-MOVING HANDS JOIN HARD-ROCK MEN TO MAKE "UNPROFITABLE" IRON MINE PAY OFF!

The Benson Mines, at Star Lake, deep in New York's Adirondacks, have been worked since pre-Revolutionary days—but working the low-grade, nonmagnetic ore by old-time methods wouldn't pay today. Now a 30-unit fleet of 22-cubic-yard trucks, rolling on Goodyear tires, moves mountains to lay the ore body bare. 4-ton drop-balls, with old tires as shock absorbers (as shown above), break blasted rock to crusher size—and ingenious spiral troughs find "pay dirt" by the ton!

Besides stripping overburden of earth, trees and brush, earth-moving hands have endless road-building work—an earmark of open-pit mining.

Goodyear 3-T Nylon Cord Tubeless Tires end tube and flap troubles forever!

NOW STANDARD AS ORIGINAL EQUIPMENT ON MANY MODELS, Goodyear tubeless tires and rims can also be specified for a wide range of construction and mining vehicles.

And it will pay you to switch to Goodyear TUBELESS on present equipment, too. Here's why:

All regular Goodyear cost-cutting features—PLUS no tube or flap troubles—PLUS no tube replacements—PLUS easier mounting and dismounting—PLUS airtight assembly—PLUS cooler running—PLUS slow leaks instead of blowouts—PLUS easier repairs—PLUS simpler, re-usable valve-parts!

Get all the facts from your nearby Goodyear dealer. Goodyear, Truck Tire Dept., Akron 16, Ohio.

NOW IN 3-T NYLON CORD—CONVENTIONAL OR *TUBELESS!*

HARD ROCK LUG

ROAD LUG

ALL-WEATHER

SURE-GRIP

GOODYEAR TIRES

Look for this sign at your nearby Goodyear dealer's. See him for better tire values —better tire care.

Buy and Specify

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Road Lug, Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

WASHINGTON OBSERVER

Building of an atomic plant in New England will begin next spring. Stone and Webster Engineering Corp. has been awarded the construction job by the Yankee Atomic Electric Co.—a combination of utilities—for a 134,000-kw plant in Rowe, Mass. The Atomic Energy Commission last week gave approval for the project, a pressurized water-cooled and moderated reactor. Construction costs and equipment will total $34.5 million.

•

Pooling power revenues to build more reclamation projects in the Columbia River Basin is being considered by the Bureau of the Budget. In fact, rumor is that this policy will be recommended to new Secretary of Interior, Fred Seaton, as something he should endorse.

Idea is to use income from electric power to finance construction of irrigation projects anywhere in the basin that otherwise could not be classed as able to pay their own way.

Such a policy, if adopted, would bring alive many projects which now stay on the shelf because water users couldn't pay enough for the water to amortize the cost. The total new construction could run into hundreds of millions of dollars.

•

Democratic attacks on Republican power policies is scene-setting for this fall's elections. A House public works subcommittee, headed by Rep. Earl Chudoff, (D-Pa.), demands that Undersecretary of Interior Clarence Davis, and Assistant Secretary Fred G. Aandahl be fired. Of course, the Administration, and new Interior Secretary Fred Seaton will ignore these attacks. But Chudoff's major charges, written after extensive hearings last year across the country, will be countered by Republicans between now and election, particularly by Seaton as the campaign gets underway.

Chudoff charges: The Administration is derelict in declining to recommend new power dams in the Columbia River Basin, is threatening the long-term vitality of the Bonneville Power Administration by excluding Idaho from the power pool. The Democrats also favor federal construction of Hells Canyon, as opposed to Administration approval of the Idaho Power Co. license from the Federal Power Commission for three low dams.

Republican members of the committee retort: "Socialism." They applaud the President's partnership program.

•

New lease-purchase bid invitations are being held up by General Services Administration: Reason: The agency isn't getting the kind of bids it wanted. There's a question about rejecting bids already received on a $1.6-million building at Rock Island, Ill.

GSA asked for three kinds of bids, but got only two. There were no bids on financing alone, four bids on construction alone, and two combination bids calling for both financing and construction.

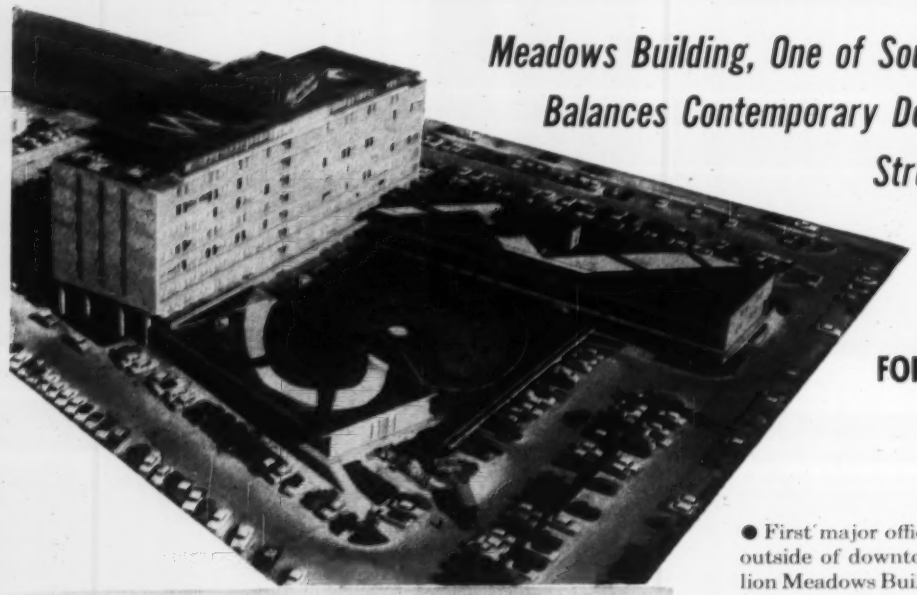
Problem is that "construction alone" bids were low—but have no financing to go with them. Combination bids are reported on the high side.

Officials have to come up with an answer by end of the month. So far some $376 million of buildings in GSA's program would be affected.

•

Reclamation engineer in charge of construction of huge Glen Canyon project, first dam of the Upper Colorado development, will be L. F. Wylie. He's been assistant regional director at Amarillo, Texas. He's worked on Hoover Dam in the '30's, was recently construction engineer at Eklutna, Alaska.

Distinction in **DALLAS**



Meadows Building, One of Southwest's Largest, Balances Contemporary Design with Utmost Structural Substance

•

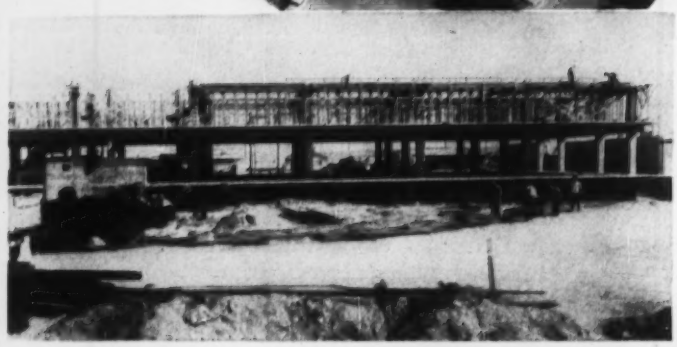
'INCOR' CUTS FORM REQUIREMENTS IN HALF

● First major office structure to be erected outside of downtown Dallas is the $4 million Meadows Building, on Central Expressway in the City's northern suburb. One of the most attractive as well as largest of its type in the Southwest, this handsome new building, with 283,000 sq. ft. of floor space, is really three separate buildings, attractively oriented around one of the country's largest elevated patio gardens, beneath which is a spacious garage.

Matching form with substance, the structures themselves are monolithic concrete, for utmost fire-safety and durability. Care in planning is reflected in the use of 'Incor'* 24-Hour Cement in the concrete frame, with the result that one set of metal forms produced the same job speed as two sets without 'Incor'. Besides form economies, 'Incor' reduces time and overhead costs through earlier completion.

Another chapter in the 'Incor' economy record . . . savings of 30 to 55 percent on form and time costs on structures of all types. Sound reason for scheduling any project so as to take full advantage of the always-dependable performance of America's FIRST high early strength portland cement.

*Reg. U.S. Pat. Off.



MEADOWS BUILDING

Owner:
EMPLOYEES' RETIREMENT FUND of GENERAL AMERICAN OIL COMPANY

Operated by:
MEADOWS BUILDING CORPORATION

Architect-Engineer:
J. N. MacCAMMON

General Contractor:
COWDIN BROS.

Ready-mix 'Incor' Concrete:
DALLAS CONCRETE COMPANY

—all of Dallas, Texas

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N.Y. • BETHLEHEM, PA. BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON INDIANAPOLIS • KANSAS CITY, MO. • NEW ORLEANS • NEW YORK NORFOLK • RICHMOND • WASHINGTON, D.C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 38,000,000 BARRELS ANNUAL CAPACITY

At ASCE's spring meeting, 700 discuss . . .

- **What gives arch dam designs promise in the U. S.**
- **How ultimate-strength methods can be put to use**
- **Are professionalism and unionism incompatible, and . . .**

ASCE's Effect on Engineer Salaries

Frankly voiced dissatisfaction with society efforts to better the economic lot of its members provoked healthy debate—and at least one positive result—at last week's spring meeting of the American Society of Civil Engineers in Knoxville, Tenn.

Leading the technical fare that was offered to the 710 registrants were five half-day sessions devoted to arch dams (see next page) and sessions on ultimate-strength design, prestressed concrete and, appropriately, multipurpose river development.

The conditions of practice controversy began in a general session on employee-employer responsibilities to each other as speaker Harry Wiersema, assistant to the Chief Engineer of the Tennessee Valley Authority, presented his personal and candid view. He said ASCE has had little effect in helping employees attain economic gains. This and the loss of personal employee-employer contact in today's large engineering organizations were held prime factors in encouraging the existing trend towards unionism by professional engineers. Wiersema also stated that engineer unions have helped, and he sees no conflict between unionism and professionalism.

A second member of the four-speaker panel contended that professional engineering employees will continue to accept unions until strong ASCE action makes the unions unnecessary.

• ASCE Answers

The tone of several questions asked during the discussion left no doubt that these views had considerable support among those present. This prompted an unscheduled statement by ASCE's executive secretary, W. H. Wisely, which equaled Wiersema's for candor. Speaking on the lack-of-action charge, Wisely said that before he had become an officer of the society, he, too, had at times felt that ASCE's efforts were lagging. But, after observing firsthand the society's many fruitful actions in this area, he was of the firm opinion that the organization was being wrongfully accused.

• Directors Act

Wisely conceded, though, that perhaps ASCE has been remiss in keeping its membership informed, he thereupon announced an action toward this end by the society's board of directors (meeting earlier in the week and cognizant of the tenor of this session through advance papers). The board appropriated $15,000 to produce an annual report of ASCE activities, which will be mailed to all members. The first report is expected early next year.

Private discussion of the controversial views raised in the general session was much in evidence. All seemed generally agreed that the frank airing was quite welcome. However, many of the conversations ended raising the broadest question of all—what should be the extent of ASCE responsibilities on behalf of its members in the socio-economic field?

Mason G. Lockwood

The board of directors seemed to reflect this concern, too, as it authorized a second $15,000 for a pilot survey of the entire civil engineering profession. Final decision on procedure for the survey was deferred until October, pending possible action by Engineers Council for Professional Development and Engineers Joint Council on a joint study of the entire engineering profession.

In other major actions, the board nominated Mason Lockwood of Lockwood, Andrews and Newman in Houston, Tex., as next ASCE president and authorized establishment of a pipelines division. The board meeting was recessed to July 10, at which time it will consider an anticipated report by the joint task committee on engineering societies headquarters.

Another bit of cotroversy spiced the five-day meeting as ASCE president Enoch Needles told a convention luncheon assemblage that civil engineering curricula at the undergraduate level should contain more specialized, practical material and halt the trend toward turning out "scientists." Just the previous day at a similar luncheon, Nathan Dougherty, Dean of engineering at University of Tennessee, had plumped for more mathematics and sciences and a turnaway from problems and fieldwork. He termed it "more know-why and less know-how."

• Ultimate-Strength Tips

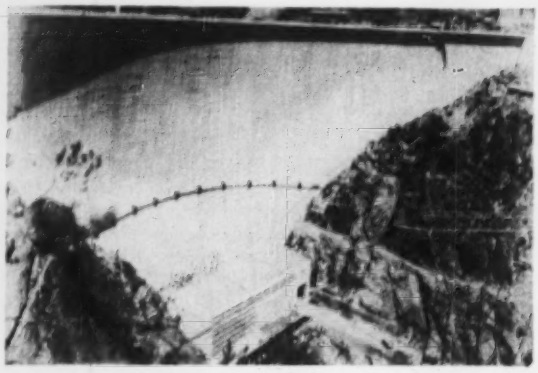
More than 200 persons attended the structural division session on ultimate-strength design of concrete. Eivind Hognestad of the Portland Cement Assn. started off by making the case for the plastic theory by citing confirmations of inelastic stress distributions in concrete. Then Raymond Reese, consulting engineer of Toledo, Ohio; Phil Ferguson of the University of Texas, Austin, and

ASCE Symposium on Arch Dams: Future Bright,

The art of arch dam designing is becoming a science. . . . The tedious work of analysis has been simplified by model study. . . . Economy over the gravity type can be 30% or more. . . . Adaptation of long arches to wide valleys may dispel the idea that sites for arches are running out.

Statements like these augured well for the future arch-dam construction both here and abroad as experts from Portugal, Italy, Japan, France and the U. S. joined in a symposium sponsored by the Power Division of ASCE at its Knoxville convention.

A distinguished Italian delegation and three youthful arch-dam enthusiasts from Portugal stole the show—the Italians, with description of their "pulvino," or concrete cushion, on which they are now basing arch dams, with assurance of



CABRIL DAM—Portgual

lower, better distributed stresses; the Portuguese, with their design of arch shapes solely by models only inches high and their thorough program of stress-strain measurements on completed dams.

But it was the brief paper of Andre Coyne of France, "Arch Dams: Their Philosophy," which did most to set the tone and the course of the symposium. This discussion was read for Mr. Coyne, who is busy with the 2,205-ft-long Kariba arch dam on the Zambesi River in Africa. His statement spoke eloquently of the affection of Coyne for the arch:

"There is no known failure of an arch dam. . . . The difficulty would seem to be not to make it hold up, but to knock it down. . . . Hyperstatic capacities enable them to compensate for unexpected foundation defects and for inadequate dimensions. . . . Elasticity is the essential quality. . . . Economy in volume is most certainly a paying proposition. . . . (Model analysis) has enabled us to go further and further in the use of wide valleys, even valleys wide at their base."

On arch-dam analysis, Mr. Coyne wrote: "The best thing to do is to put up with simplified calculations, giving results within two limits and to get from them courage for choosing a given design. This is then immediately elaborated on the model, retouching this model several times over so as to gain little by little on volumes and stresses. . . . Today, overexacting calculations . . . are only undertaken as a final check, after all the dimensions have been established in the laboratory."

On this statement by Coyne there was comment by Julian Hinds, famed U. S. dam designer who was among the developers of the tedious and time-consuming trial-load method of arch analysis. Submitted Hinds: "The work involved is overestimated."

Rocha, Serafim and Da Silveira, from the National Laboratory of Civil Engineering in Lisbon, Portugal, told and showed by a movie how they have analyzed solely by models six of the twelve arch dams built in Portugal just since 1946.

Model tests, claimed the laboratory's acting director, Rocha, cost less in time and money than trial load analysis; models are their tools for design; they are not a check on analytical methods.

Ebasco's R. A. Sutherland, chairman of the Power Division, commented on the Portuguese presentation: "It looks like a great deal more model study will be done in the U. S."

The Italians also had model studies to describe, with Guido Oberti, director of the famed structural lab at Bergamo, detailing test methods on arch-dam shapes.

Charles Whitney of Ammann & Whitney, New York City, presented practical design procedures. Among the points made:

- Approach ultimate-strength design on basis of obtaining a more rational design.
- Plastic design will often yield very shallow beams whose depth will be controlled by deflection. To reduce deflection either add compression steel or introduce camber.
- Control of concrete during construction is not as critical as some have made it out to be. Re-distribution of stresses means still additional safety factor.
- Presently recommended overload factors yield working load stresses closely approximating those obtained from working stress design methods.
- In the vast majority of designs, a rectangular stress block should be chosen for simple flexure.
- In beam design assuming value of J will speed design.

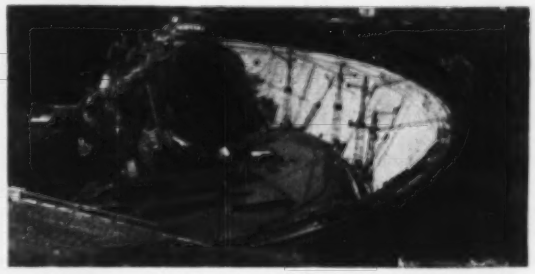
• Cable friction in post-tensioning—At the prestressed concrete session, T. Y. Lin of the University of California at Berkeley, summarized his extensive work on cable friction in post-tensioning. He determined three sources of friction loss: From the so-called "wobble effect" or small humps and valleys that cannot be avoided even in straight cables, from the vertical component of force in curved wires, and from bond when the initial concrete penetrates through to the tendons (a case where the sun cracked the sheathing was cited).

Losses can be reduced or compensated for by overtensioning the wires, by applying a modest amount of pretension, by pulling cable from both ends, reducing coefficient of friction with lubricants—preferably the water soluble type, and possibly by vibrating the tendons to get them loose from their restraints. In summary, Lin cautioned that frictional losses in curved cables could be serious, but thought losses in straight wires could be made insignificant by exercising reasonable care.

• Unusual wind framing—At another structural division session, Ross Bryan, consulting engineer in Nashville, Tenn., described the design of a 30-story building in Nashville which, because of a height-to-width ratio of 9, necessitated vertical cantilever trusses to resist wind shears. And as might be expected, foundations for the wind frames had to be designed for considerable uplift-up to 1,700 kps in magnitude. Anchorage is by means of 3-ft dia cores drilled 20 and 25 ft into bedrock and filled with high-strength concrete.

A hint of the type of design requirements for the atomic age was given by Gibson Norris, Chief Engineer at the Oak Ridge National Laboratory as he revealed first details of an unusual tower structure. The nuclear physicists wanted to suspend in space a 55-ton

Popularity Established



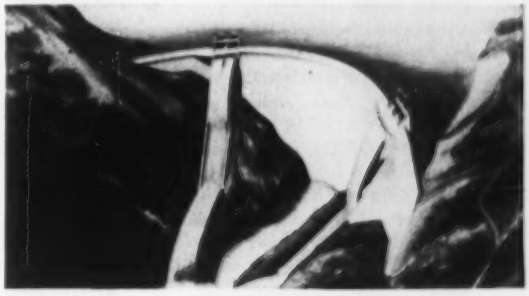
PIEVE DI CADORE—Italy

• ANOTHER RECORD INDICATED—Carlo Semenza, manager of hydraulic construction, Societa Adriatica de Elettricita, gave his reasons for Italy's prominent place among the builders of arch dams—65 arches among 180 major dams. He credits the Italian mentality, individualistic and free from preconceived ideas, along with geologic and economic factors. Tracing the history of arch dams in Italy, he came up to the present with word—a bare mention—of Vajont Dam, now under construction as an arch to be slightly over 850 ft high.

"In Italy in many cases there is no hesitation in adopting the arch structure even in not altogether favorable geological conditions . . . provided the appropriate measures are taken." Among these measures is the perimetral joint, described by Mr. Semenza as a way to preclude concentrations of stress near abutments and foundations; tensile stress in the upstream face can be completely suppressed by separating the arch itself from the rock, by putting it on the regular surface of a concrete cushion which fills and smoothes the irregularities of the foundation rock even to the extent of bridging its weaker spots. A well defined geometric shape of curved plate can be designed and jointed to the cushion with lower stresses, better-distributed, as the result.

R. W. Gunwaldsen described Ebasco Service's design of Kamishiiba, Japan's first arch dam, a 372-ft-high structure completed last year. This was an uneconomical project as a gravity dam; Ebasco figures $5 million was saved by building it as an arch. In addition, construction was completed and 90,000 kw of much needed power was put on the line one year earlier than a gravity dam (with perhaps three times the concrete) could have been finished. On Kamishiiba, the Japanese chose to gain experience with the trial-load method; they performed the intricate analysis themselves.

The future of arch dams, with their generally used 1,000-psi allowable concrete stress and their safety factor of 5 (preferred as a flexible figure) does not depend upon improved concrete technology. Members of the symposium agreed that without changing concrete quality, improved, more economical designs will be made possible through increased knowledge of the behavior of the structure and its foundations. A particular problem is the effect of temperature, which can induce stresses in the concrete of the same order as stresses due to the loads. Tests on Ross Dam on the Skagit River in Washington were described as checking fairly well trial-load analysis of the 26-year-old structure; discrepancies between figured and measured stresses were reasoned to be due to temperature effect.



KAMISHIIBA—Japan

Future arch dams are quite apt to have free overflow spillways, with less concern by the designers about how much water is let drop how far. Ebasco representatives pointed to their application to build Pleasant Valley Dam on the Snake River as a 435-ft arch with a 400-ft free overfall of 300,000-cfs flood flows.

radiation source and a 35-ton unit containing measurement devices, the radiation source being required to move vertically and the controls having to move both vertically and horizontally. Tippetts-Abbett-McCarthy-Stratton of New York came up with a scheme involving two lattice column bents 100 ft wide, over 300 ft high and several hundred feet apart, the structural members being 9 ft square. A system of hoists suspend the loads across the two guyed bents. These loads are raised and lowered for each experiment.

Multipurpose river development was the theme of a general technical session and numerous divisional meetings. A panel consisting of Gail Hathaway of the Corps of Engineers, Wilbur Dexheimer, Commissioner of the Bureau of Reclamation, and E. R. Deluccia, Chief Engineer of Pacific Light & Power Co. in Portland, Ore., reviewed the history of multipurpose river development and saw no other manner in which to treat the Nation's streams.

• **Record Wilson Lock**—Designing the record 100-ft high lock at Wilson Dam on the Tennessee River meant solving hydraulic problems of a similar record magnitude. At the TVA hydraulic laboratory in Norris, Tenn., a 110x600-ft lock chamber is determining hydraulic characteristics of entrance culverts and a bottom lateral system capable of handling without cavitation the 20,000-cfs flow required to fill the lock in a reasonable time.

A replica of a navigation canal joining the lock with the main stem 2½ mi downstream has been constructed to solve a tricky flow problem at the canal mouth. There several bridge piers and rapid river flows endanger navigation of the existing three-lock system (the first lock being at the canal mouth).

Construction of the lock in existing Wilson Dam, eight sluice gates will be taken out of service, is scheduled to begin this year and completed by 1959 at a cost of $35 million.

• **Anaerobic sewage treatment**—Six months of successful laboratory operation of a completely anaerobic sewage treatment plant was described by U. S. Public Health Service personnel from the Cincinnati Research Center. The setup consists of a sludge contact chamber and a rock column filter. It was developed to provide cheap treatment for individual homes or small sub-divisions. A pilot plant will soon be built in a small Ohio town and will operate in conjunction with an existing complete treatment plant.

The sanitary engineers again considered their perennial education question. A distinguished panel more or less agreed that a 4-year curriculum should contain plenty of biology, chemistry and mathematics with a few sanitary courses. But the major sanitary work should be given at the graduate level.

PROGRESS REPORT:

Construction and the 84th Congress

Congress this year is enacting the biggest public works program in history. With Administration backing, the legislators are putting through not only the greatest highway plan ever attempted but, in addition, a series of bills that assure increased construction activity for water resources projects, military bases and other federal works.

Topping the list of long-range programs are the $50 billion or more of promised highway construction and the initial authorization for the multi-billion-dollar Upper Colorado River project. Along with these two, the current session is authorizing and voting money for water improvements, housing and military construction that pave the way to greater volume in these areas.

Right at the start, Congress set the pace for construction activity in this session by fast approval of urgent appropriations to start a half-dozen dams and other flood-control works in the storm-ravaged Northeast. The pace has been well maintained since then.

Already, the present Congress has racked up the largest total of specific reclamation authorizations ever recorded. So far this year, the two houses have authorized nearly $900 million for the starting phase of Upper Colorado plus four other projects. With the $225-million Trinity River project voted last year, the total comes close to $1.2 billion for the 84th Congress. And $230 million in five other projects still pending may boost it even higher.

Construction on military bases is due to go up on two counts. Congress and the Administration are getting together on larger sums than were originally asked for to build bases. And both the House and the Senate agree on an increased and extended authorization for building privately financed housing to accommodate military families.

Categorically, here are the issues before this Congress:

• Housing

Housing legislation is firming up. The Senate has passed a housing bill, and the Banking Committee on the House side is putting out a measure of its own that parallels the Senate version in many respects but differs in others.

As the odds stand now, here is the outlook for Congressional action on housing:

• Public housing will probably come out with an authorization at about the present level of 45,000 units a year, as a compromise between the Senate's 135,000 and a much lower number that the House may approve. Sure to be included in the public housing provisions this time is a category for elderly people, aged 65 or over.

• Best chance for continuation of the GI home loan program for World War II veterans beyond July 25, 1957, is the one-year extension voted in the Senate bill. This extension may be retained by House-Senate conferees on the two measures. The House Banking Committee has dropped GI loan provision from its bill only because of a protest that was received from the chairman of the Veterans Affairs Committee, which claims jurisdiction.

• Privately-financed family housing on military bases will be stepped up from the 100,000 units presently authorized to 150,000 to 200,000 and the program will be extended three years to Sept. 3, 1959. There is a chance, too, off-base construction may be added to give local homebuilders a share of the business.

• Housing credit will be strengthened by making it much easier for builders and lenders to sell VA and FHA mortgages to Fannie Mae, the Federal National Mortgage Association. Required stock purchase by sellers to Fannie Mae will go down from the present 3% to about 1%, and the agency will have authority to pay more than the market price for mortgages. For special programs such as urban renewal, disaster and cooperative housing, the price is likely to be set at par for a year, at least, by the new law. Less likely to go through is authority for Fannie Mae to issue standby, mortgage commitments to help builders of new houses obtain financing.

• Builders and redevelopers of property under the urban renewal provisions of the present law will enjoy more liberal FHA mortgage insurance, including a risk and profit allowance up to 10% of project cost, excluding land. And cost certifications will become incontestable upon FHA approval, barring, of course, fraud or false figures.

• College housing loans will continue on the same interest rate formula now in effect, ¼ point above the average rate for long-term government borrowings. Congress will approve the additional funds that will be needed for government loans, as private investors cannot compete on this rate basis.

• Old people can be sure of housing aids in addition to special provision made for them under low-rent public housing. Easier FHA mortgage terms and government loans at low interest to non-profit corporations are the leading possibilities in this field of legislation.

• Home improvement loans insured by FHA definitely will go up from the present limit of $2,500 for three years to $3,500 for five years.

• Power Projects

The three-dam Hells Canyon project now under way by Idaho Power Co. could conceivably be blocked by legal action pending in the courts. If this should happen, the drive for federal construction of a single high dam will gain momentum. But Idaho Power reports it already has spent more than $4 million on preliminary construction work. In the East, the Niagara redevelopment project is no nearer solution. Pending legislation calling for development by the New York State Power Authority has been approved by the Senate. House action on the measure is not expected to be favorable. Major House objection is to the provision in the Senate-approved Lehman bill giving first preference on power to public power bodies and cooperative action is expected shortly.

Funds for atomic energy construction are not being handled in one of the regular appropriation bills this year, but will be included in the supplemental bill which will be passed later in the session.

• Military Construction

The $2-billion military construction authorization voted by the House in April is due to come up in the Senate within a few weeks. A Senate armed services subcommittee has concluded hearings and is expected to report to the full committee not later than next week.

The Senate is expected to increase the House figure. President Eisenhower has asked for additional military buildup, involving some $100 million of construction, since the House passed its bill.

House approval of $2,156,730,000 for military construction at home and overseas was worked out after the House made several changes in the $2,023,336,000 approved by its Armed Services Committee. The House deleted $72 million for unidentified construction and put it to a seperate bill which was passed independently by both the House and Senate and is now public law.

The House added $131.7 million for the Air Force, $1.1 million for the Navy and $485,000 for the Army. Also for the Army, the House put in $440,000 for Major Field in Texas, and $100,000 for a study involving relocation of three navy facilities.

As passed by the House the funds would be apportioned like this among the services: $305 million for the Army, $402 million for the Navy, $1.269 billion for the Air Force, $150 million for surplus commodities and $30 million for emergency housing construction Title IV.

• Water Resources

On money for public works projects, the Senate Appropriations Committee last week added $80.9 million to the $790.7 million voted by the House. This was primarily for additional Corps of Engineers and Reclamation projects. The bill covers funds for the Tennessee Valley Authority, the Bureau of Reclamation, the Corps of Engineers, Southeastern Power Administration, the Southwestern Power Administration, and the Bonneville Power Administration.

The bill, as it goes to the Senate, exceeds the 1956 appropriation by $24 million and budget estimates for fiscal 1957 by $53 million.

In the Bureau of Reclamation construction program, the committee upped funds from the $125.9 million voted to the Senate to $138.9 million and in addition approved the application of $20.3 million of prior year funds to projects.

Biggest Senate addition was $7.5 million for the Yellowtail unit of the Missouri River Basin project, which had not been included by the House. In addition, the committee approved the use of $3.6 million of prior year funds, to provide for a total program of $10,850,000—the budget estimate. However, there is some question of whether the work will be able to go forward. President Eisenhower recently vetoed a bill to pay the Crow Indians $5 million to settle their claims on the land. Construction work cannot go forward until Chief Yellowtail has been satisfied in his claim and orders his people to vacate the land.

The reclamation increases also provide additional money for the following projects: The Ventura project in California was upped from the $250,000 voted by the House to $6.4 million; Washita Basin in Oklahoma was brought up to the budget estimate of $500,000, an increase of $125,000 over the House figure; $1 million for the Colbran project in Colorado, which had been allowed nothing by the House; and $1,750,000 for the House-ignored Helena Valley unit in Montana, plus $2,250,000 from prior year funds.

For the Colorado River storage project, the Senate upped the House allowance of $6 million to $13 million—the amount recommended for starting Glen Canyon unit in Arizona, the Flaming Gorge unit in Utah and Wyoming, and the Navaho unit in New Mexico.

On civil functions, the Senate committee upped the House allowance of $422 million for construction to $463 million. The increases were primarily in small amounts added to individual projects. Largest single project increase was roughly $5 million to the $11 million for Garrison Dam in North Dakota. The dam, which is expected to cost $294 million to complete, has already received $251.7 million.

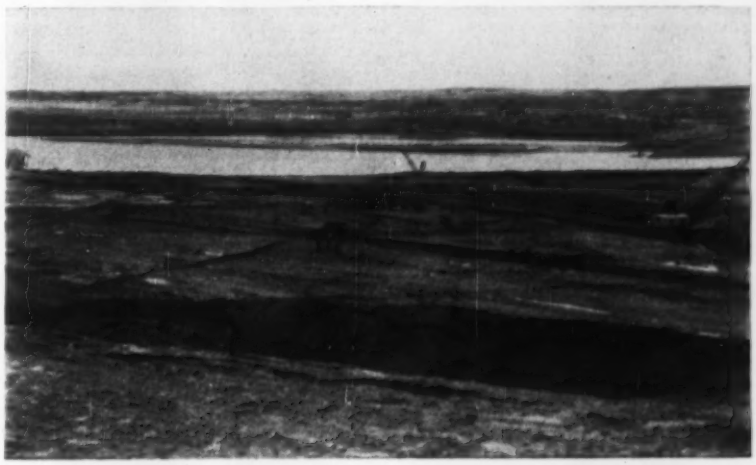
In Michigan, the Senate committee shifted to construction stage some $6.9 million earmarked for planning by the House. Largest amount—$5 million—would go toward starting work on the $150-million Great Lakes channel connecting project.

The Senate committee left unchanged the $18.7-million construction money for Bonneville Power Administration.

For the Southwestern Power Administration, the committee authorized the use of $290,000 for constructing transmission facilities to serve Bentonville, Ark.

The committee not only did not approve any construction funds for the Tennessee Valley Authority, but expressed its opposition to TVA building new generating units without coming to Congress for authorization or funds. The policy statement approved by the committee:

"The committee believes it is unwise for the Tennessee Valley Authority to continue a policy whereby units can be added at existing plants without coming to Congress for authorization and funds. The committee urges the appropriate legislative committee to act on this matter in order to clarify this situation before the next appropriation request is submitted to the Congress."

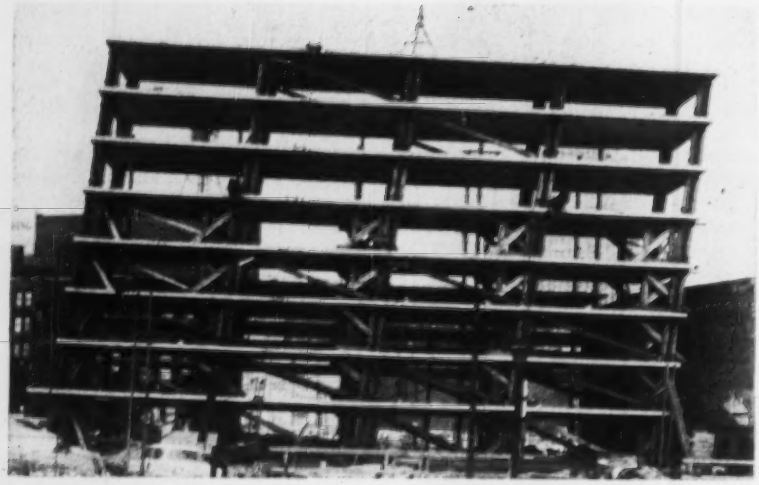


Costly Slide at Oahe Dam on Missouri

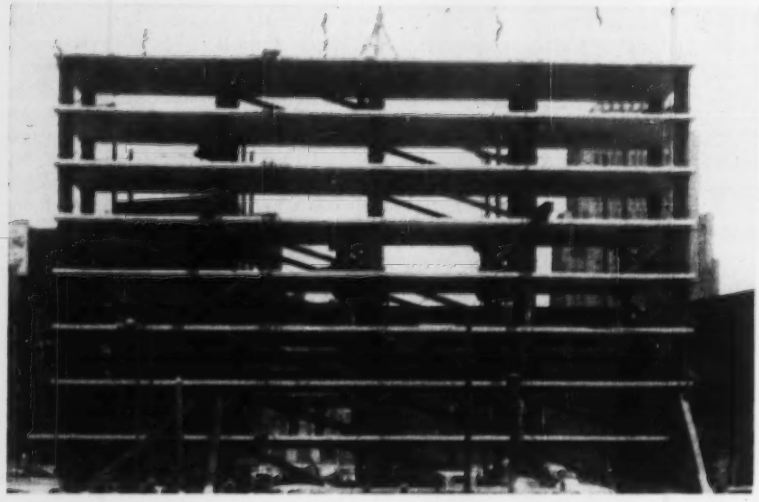
An extensive earth movement in the area of the left abutment of Oahe Dam—under construction by the Corps of Engineers—may call for expensive remedial measures including:

- **Moving the powerhouse location 800 ft downstream.**
- **Removal of 5,000,000 cu yd of disturbed material.**
- **Flattening the slopes and crest of the embankment.**
- **The earth movement is similar in nature but considerably larger in scope than the slides which have occurred on the right bank. It involves a mass of weathered shale that, with an intervening layer of slippery bentonite, rests above a layer of firm shale. Triggered by excavation work, the movement first became apparent last December.**

The block of disturbed earth is 2,500 ft wide, 1,200 ft long and varies in thickness from 10 to 50 ft. Vertical displacement varies from a few feet to 30 ft while the mass crept horizontally a distance of from 8 to 12 ft.



BEFORE: The tilted Cleveland garage was shored to prevent further tilting and timber jacks were placed diagonally between bottom columns.



AFTER: Though main pushing forces were exerted only in the lower stories, the diagonal jacks brought the columns back to the vertical.

Tilted Garage Straightened

The eight-story, lift-slab parking garage in Cleveland that tilted 7 ft to one side on April 7 is plumb again.

The garage consists of two independent sections, each 91x21 ft in plan, between which elevators for cars will operate. The 8-in. thick, 90-ton concrete floor and roof slabs were erected with jacks placed atop the ten 8-in.-square hollow steel columns in each section (ENR April 19, p. 25).

After the close of work on April 6, the eight slabs of one section had been wedged in place, but none of the connections between the steel collars in the slabs and the columns had been welded. Winds that night are reported to have been responsible for shifting the structure out of plumb. The structure was immediately shored to prevent collapse (ENR May 3, p. 25).

• **Taking out the tilt**—After being delayed three weeks by a local strike, straightening operations started May 22. The procedure took 4½ days.

Planning of the operation was handled through the combined efforts of B. M. Gensert & Associates, consulting structural engineers; Barber, Magee and Hoffman, consulting structural engineers; A. T. Knudsen Co., underpinning contractors, and Central Lift Slab Co.—all of Cleveland.

The approach finally adopted was dictated by inaccessibility to adjoining property. This meant that all righting operations had to be confined to the structure itself, thus adding to the internal stresses already present.

Steel cables were installed X-fashion between corner columns in each story and on all four elevations of the structure. Ends of each cable were looped through lifting holes in each cast steel collar embedded in the slabs at the columns. This was done so that forces acting would be transmitted directly to the concrete slabs, rather than to the stressed columns. Size of these cables on upper stories was ⅝-in. dia; lower stories required ¾-in. cables, since the forces increased progressively from top story to ground. Function of the cables was to keep the structure in position as straightening progressed.

Timber jacks were installed diagonally between columns in the first story. These jacks were positioned against large timber blocks at the base of the columns and inclined toward the upper part of adjacent columns.

As a preliminary step, jacks in upper stories were used to determine how the structure would react to increments of turns on jack drums. But main pushing forces were confined to the lower stories, since it was desired that forces get to the ground as directly as possible. Jacks were not installed in the end bays because there would be insufficient concrete to confine the forces within the slabs.

As an added precaution against tipping in either direction, heavy cables were anchored to dead men on one side and tied to heavy timbers placed on the sixth floor. Corresponding cables on the opposite side were anchored to the base of columns of an adjacent tower.

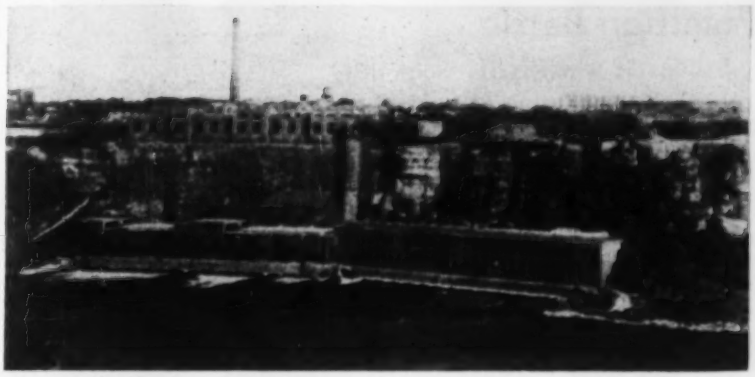
Several counterstruts were installed to give additional assurance of the structure's stability.

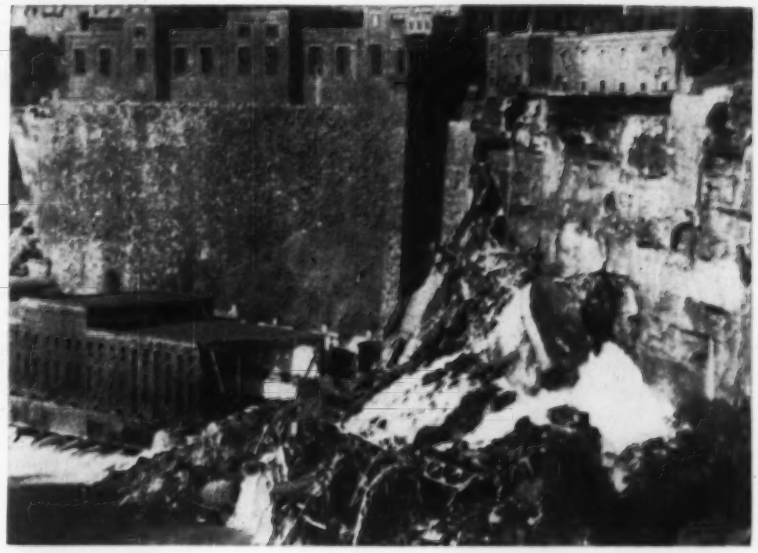
Additional precautions were taken to prevent collapse due to local stresses. Since corners of four slabs were cracked as a result of the initial displacement, they were shored. Timbers were lashed to two faces of columns on all floors to prevent any slab from dropping, since the supporting load wedges were not yet secured. These timbers also served to prevent external buckling of columns, particularly in the lower stories. The possibility of internal buckling was also guarded against by filling the hollows in the columns with ¾ in. gravel up to the fifth floor. Intrusion mortar will be forced into the gravel at a later date.

• **Timber cushioning**—Extensive use of timber for the jacking operation was primarily due to its cushioning properties. For instance, in the first step, pushing jacks were tightened, then the heavy counterstruts released. As soon as this was done, the diagonal cables were tightened, to maintain the position of the structure, and then the operation was repeated. In this way, the structure was returned to vertical, a fraction of an inch at a time.

BEFORE:

Until last Thursday, Niagara Mohawk's sprawling Schoellkopf station sat at the bottom of the 220-ft gorge below Niagara Falls, its 400,000 kw the largest of the utility's installations. Early in the day, there was a serious water leakage into the plant; a pumping crew worked until 5:10 pm, when windows popped, rock fell and all but one man had time to get out alive.





AFTER:

When the slides subsided and the dust cleared, 50,000 tons of rock and debris had knocked out two-thirds of Schoellkopf station for a total loss estimated at $100 million. Transmission lines through the plant were cut off, leaving Niagara Falls temporarily without power, and the part of the plant left standing was flooded. The area was alerted for further rock falls, and preparations were made to dam the power canal above the plant and seal off the power tunnels so that possible repair and cleanup work could begin.

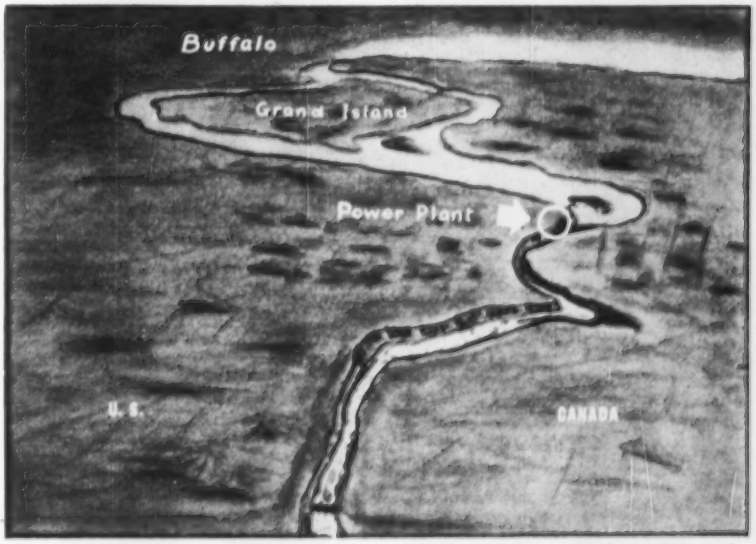
Tremor Triggers Niagara Rock Slide

A very slight earth tremor opened the crack and started the seepage that caused the slide which demolished the power plant in the Niagara Gorge last Thursday.

This is the best available early analysis of what happened.

A team of geologists was brought in to study the slide: New York State geologists John J. Broughton and James R. Dunn, plus Canisius College seismologist Austin C. McTigue.

It was Professor McTigue who said a very slight earth tremor caused the cracking in the limestone and dolomite on the U. S. side of the gorge. The 'quake did not register on the Canisius seismograph in Buffalo, so the professor could not pinpoint when it happened, but he asserts that it was probably part of a pattern of minor movements of the earth's crust in the general area. He is sure the slide was not due to erosion; something had to trigger it.



PLANT LOCATION is only about 2,000 ft below the American Falls, where two years ago a sizable piece of Prospect Point broke away and fell from the brink.

Pollution Battle

Ohio is winning its fight against pollution of water

According to G. A. Hall, engineer-secretary of the Ohio Water Pollution Control Board, 60 Ohio cities now have adequate sewage treatment and 27 municipalities are building new plants or additions. Fifteen others have inadequate plants but have submitted general plans for improvement, and 16 are without sewage treatment facilities of any kind, but have plans for start of construction soon.

Currently, the state's biggest problem is a 20-mi stretch along the Mahoning River from Warren through Youngstown where there is no sewage treatment in communities with a population of 269,895. Youngstown is the last of the larger cities (those with populations of more than 100,000) which has no treatment facility, Hall said.

The board has given Youngstown until July 16 to adopt a financing program.

Other cities which had been under pressure from the board include:

Zanesville, with a recently-approved $4.9-million bond issue for a sewage disposal plant.

Sandusky, which has authorized a sewerage service charge to finance its program.

Toronto, with bonds approved.

Wellsville, Napoleon and Struthers are working on financing programs.

Warren has completed plans and **Niles** has Engineers working on its plans.

Norwood is constructing sewer lines to connect with Cincinnati.

Before the board are two cities. Girard has made no progress. Gallipolis voters rejected a bond issue proposal to build a plant. In addition, Canton, Jackson, Kent, Shelby and Wadsworth have wholly inadequate treatment plants.

Hall listed the following progress in sewage treatment plant construction since 1951:

- Nine cities—Ashtabula, Athens, Cambridge, Coshocton, Maple Heights, New Philadelphia, Ironton, Logan and Miamisburg—built new plants where none existed before.
- Improvements, expansions and enlargements of previously inadequate plants were made by Bedford, Dayton, Delphos, Findlay, Fostoria, Galion, Lima, Marion, Medina, Troy and Wilmington.
- New plants have been completed in Lorain, Marietta, Nelsonville, Port Clinton, Steubenville.
- Under construction at the present time are new sewage treatment plants in East Liverpool, Conneaut, Defiance, Dover, Garfield Heights, Hamilton, Kenton, Maumee, Middletown, New Boston, Painesville, Portsmouth, Sidney and Tiffin.

Hall said Campbell, Mansfield, Piqua and Wapakoneta soon will start construction of plants where none had existed before. Improvements and expansions are under way in Akron, Cincinnati, Cleveland, Columbus, Ravenna, Salem, Toledo, Van Wert and Oberlin.

Wide World Photo

Once in the Same Place Is Bad Enough

A bad stroke of lightning—plus some 5,000 lb of dynamite—did the damage to this 22-ton rock-body truck and 2-yd shovel. The scene: S. J. Groves & Sons' (Minneapolis) job on the Massachusetts Turnpike, near Russell. Investigators of the mishap said that lightning struck the dynamite cache.

Financial Snag

Investment group urges Ohio to postpone tollroad

It appears that Ohio's proposed Turnpike No. 2, a 301-mi, $385.8-million superhighway from Cincinnati to Conneaut, may be put on the shelf for a while.

A financing syndicate headed by Blythe & Co., Inc., of New York, recommends that the project be postponed, until revenues from the east-west Turnpike No. 1 are more definitely determined. The financial men feel that operating results on Turnpike No. 1 have been disappointing during its first seven months.

T. Henry Boyd, Blyth vice president, told the Ohio Turnpike Commission that this is not the best time to issue the bonds for the new tollroad.

Boyd also feels that effects of the new federal highway program on the financing of turnpike projects should be evaluated before Ohio takes any further action on the second turnpike.

The Blyth recommendation was made after the investment men studied engineering reports by J. E. Greiner Co., of Baltimore, and reports on estimated traffic revenue by Coverdale & Colpitts, of New York (ENR May 24, p. 24).

The Greiner report estimated that the entire Cincinnati to Conneaut four-lane superhighway would cost $385.8 million for right-of-way and construction (excluding financing costs), while an alternate plan, calling for a road that would be part-toll, part-free, would cost approximately $346 million.

If the entire project was built as a tollroad, revenue for the first year would be about $21.3 million, according to the Coverdale & Colpitts estimate. Revenue would be $17.5 million for the "split" highway, in which a center segment from Route 40 east of Springfield to Route 23 south of Delaware would be built as a free road.

In SOUTH AFRICA too . . .

TYLOX
Rubber
PIPE JOINTS

are specified to make waste lines

- ★ ***LEAK-PROOF***
- ★ ***CORROSION-RESISTANT***
- ★ ***LONG-LASTING***

Here, a native African installs high pressure TYLOX Gaskets (bell assembly type) shipped from half way around the world to couple this pipe and protect its joints against leakage and acid attack.

The project, at Sasolburg, Orange Free State, South Africa, called for over 50,000 feet of TYLOX-jointed pipe for disposal of *both* sewerage and industrial wastes. It was a joint project of the Town of Sasolburg, and The South African Coal, Oil and Gas Corporation, Ltd. Pipe was manufactured and laid by The Roberts Construction Company, Ltd.

The question "what joint?" for this double-duty line was quickly resolved by the designers . TYLOX — which cuts construction costs by speeding pipe work, leak-proofs joints by its compression seal, and never deteriorates because of the special compounding of its rubber — was the *only* pipe joint fully meeting their requirements for pipe line economy, safety and longevity. And they were willing to go half the world away to get it.

5012

WRITE FOR OUR NEW TYLOX BOOKLET . . .

. . . read the facts on TYLOX, the only flexible joint meeting requirements of designer, builder and taxpayer alike. See why TYLOX is specified for big, important pipe jobs all over the world. Specify TYLOX to assure economy, safety and longevity on your pipe projects.

HAMILTON KENT
MANUFACTURING COMPANY
KENT, OHIO
427 West Grant St. Orchard 3-9555

ADS LIKE THIS | AND EQUIPMENT

90 miles to Abilene... TONIGHT

George Miller ships better beef at lower price to your table, thanks to Texas' splendid ranch-to-market roads

George Miller still remembers the great week-long cattle drives to the railhead at Abilene. Tough on men—and cattle. Then came the old high-wheel trucks, fighting through "liquid mud and iron furrows." Weather, not cattle or market conditions, determined shipments then.

Today George Miller ships cattle when they're ready. The once-rugged drive is now a two-hour trip over paved roads. There are 30,000 miles of ranch and farm-to-market roads, and half a million Texans live within a lariat's throw of them. An estimated $2 billion in livestock and crops is trucked over them annually.

But this is only part of the story. Like everything else in Texas, the highway problem is big. The state ranks third in motor vehicle registrations, and its drivers average 100 million miles a day. It has big cities with traffic problems of their own. So, even though its 55,000 miles of road are the most of any state's, Texas highways are still inadequate.

In the last five years Texas has built 17,000 miles of road at a cost of $526 million. At present, $175 million is under construction. But 12,000 more miles—principally four-lane and two-lane highways—are needed. This expansion will cost $2.2 billion—and will be worth it all in added safety and economy.

Like Texas, your state knows it can't afford *not* to have good roads. If you want to know how you can help put your state's highway program across, drop a post card for the free booklet, "Road Block," to Dept. 6, Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

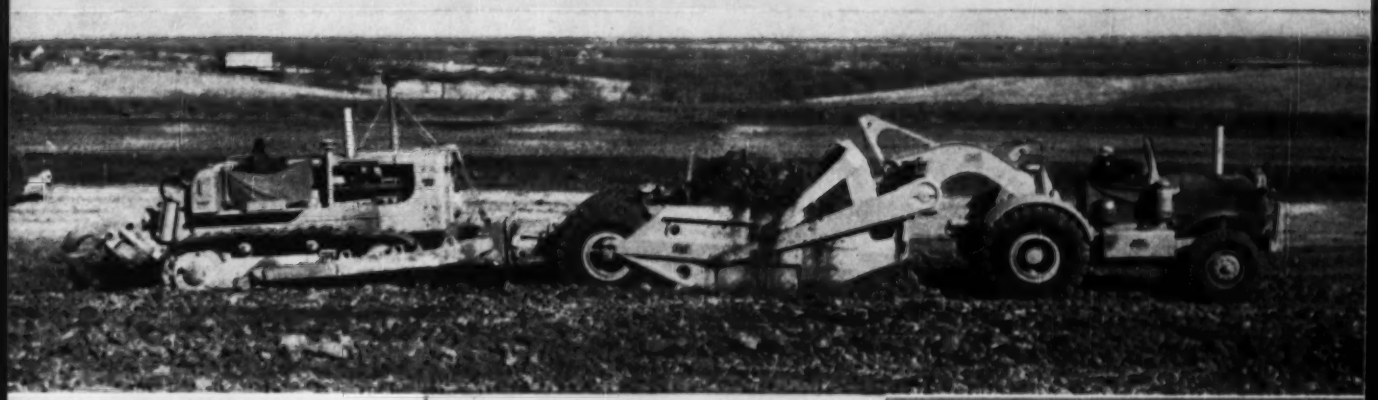
REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Wherever you see Caterpillar machines working on your roads, you can be sure your state is getting its money's worth.

This advertisement appears in full color in *The Saturday Evening Post*, June 16.

LIKE THIS ↓ CAN BUILD BUSINESS FOR YOU



Caterpillar DW20 and D9 at work on new turnpike between Dallas and Fort Worth. Equipment is owned by Cage Bros. of San Antonio. Dick Atkins (right), job superintendent, says: "We like the performance of Caterpillar machines. We get more operating hours out of them, and we get better service from Caterpillar Dealers." Yellow paint predominates on this job.

THE advertisement on the opposite page is one of a long-continuing series by Caterpillar, dedicated to the public understanding of the need for better roads—and how to get them.

You can help increase this understanding by encouraging your local television stations and civic and cultural groups to show the Caterpillar film, "Road Block." It's entertaining, informative, non-commercial—and lent free. Your Caterpillar Dealer has details.

And you can speed up cycle times and reduce operating costs on your jobs with equipment from the new Caterpillar rubber-tired and track-type Tractor lines. For example, the new CAT* DW20 with No. 456 Scraper, shown here working on the Fort Worth-Dallas Turnpike. This 29.6-mile, $58.5-million highway is scheduled for completion in July of next year, and is expected to handle more than 11 million vehicles in its first year.

The new Caterpillar DW20 (Series E) can highball at 32.1 MPH, thanks to its Turbocharged, four-cycle diesel engine which develops 300 HP (maximum output). Its companion No. 456 Scraper features LOW-BOWL design that is wider, lower and longer than conventional scrapers for faster material-handling and less resistance throughout the loading cycle.

In informing the public, in developing new and better equipment, in prompt service and reliable replacement parts, Caterpillar Tractor Co. and its dealers are working with you and *for* you in America's great construction program.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

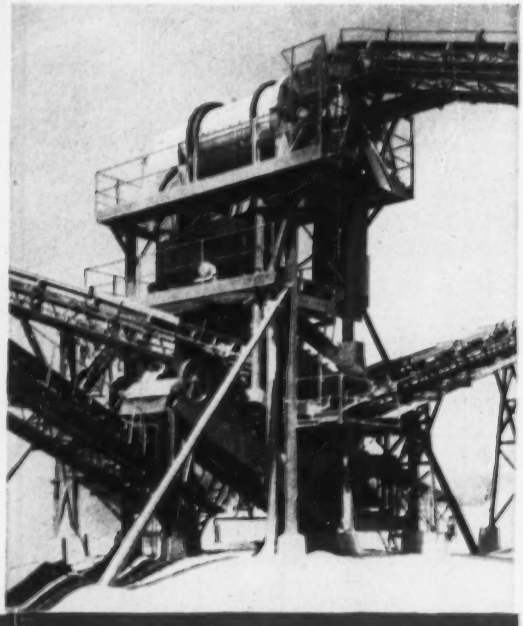
*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

LEADERSHIP IN ACTION

as modern as they come...

DESIGNED AND EQUIPPED BY TELSMITH

New Plant of L. Romano Construction Co., East Providence, Rhode Island, processes 200 tons per hour of washed aggregate—sand, and 3 sizes of gravel all under 1½" and stockpiled. Telsmith designed the plant, and built the machinery. Send for Telsmith Complete Plant Service Bulletin 278.



Crushing Plant (*above*)—Plus 4" gravel goes to a 18" x 32" Telsmith Jaw; plus 1½" gravel to a 36-S Gyrasphere Crusher; the scalper is a 4' x 12' Telsmith 2-deck Vibro-King. **Washing Plant** (*right*) has a 72" Telsmith Super-Scrubber; two 4' x 12' Telsmith 2-deck Vibro-King rinsing-sizing screens; 24" x 20' Telsmith Twin Screw Sand Classifier.

Many Features of Modern Design— In this plant both Telsmith Crushers are high capacity, low maintenance machines. The large-capacity Telsmith sizing screens have spray bars on every deck. The extra heavy-duty Telsmith Super-Scrubber takes out the clay as well as soft stone, assuring top quality aggregate always. Send for Telsmith Bulletin 266.

SMITH ENGINEERING WORKS

500 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

Representatives in Principal Cities in All Parts of the World • **Cable Address: Songworks, Milwaukee**

With rebuilding of old treatment plant . . .

Bay Cleanup Program Begins

Construction on a key project in Rhode Island's long battle to clean up Narragansett Bay pollution began last week (June 5) in Providence.

The Baylor Construction Co. of New York City moved in men and equipment to begin rebuilding of the city's large but antiquated Fields Point sewage treatment plant—a $3,644,000 job that will take about two years to complete.

For years, Providence has been a chief contributor to bay pollution as the outmoded plant dumped practically raw sewage into the Providence River which empties into the bay. Only treatment of the sewage with extra-large amounts of chlorine—a costly process—is producing an effluent which will meet even minimum standards set by the State Sanitation Division.

Plans for the rebuilding job were drawn by Metcalf & Eddy, Boston engineering firm, after a series of plant scale studies which began in 1952. In that year, voters and the State Legislature approved a $3,500,000 bond issue for the work and this year the legislature added another $900,000 authority to cover construction cost increases since 1952. The latter issue is expected to be approved by the voters in November.

Because of the bonding arrangement, the Baylor firm bid on the contract in two parts—$3,135,000 and $509,440—and will be awarded the second part when the bond money becomes available.

The reconstruction job will entail:

- Expansion of the present plant capacity of 45 mgd to a daily average of 64 mgd and a peak of 160 mgd. This is approximately 3½ times the present load.
- Addition of two treatment processes—step aeration and biosorption—to the present activated sludge process to provide a more efficient, rapid handling of the complicated industrial wastes which pour into the system.
- A complete rebuilding of primary and final settling tanks, aeration tanks, grit chambers, pumps, blowers, the chlorination system and the administration building.
- Among the largest structures which will get the face-lifting will be five final settling tanks, each 105 ft square, which will be modified and have new machinery installed. Two new circular settling tanks, each 115 ft in dia, will be added. All will be of reinforced concrete.
- The present sixteen aeration tanks, each 115 by 60 ft, will be replaced by ten tanks, each 247 by 60 ft.
- The chlorination tank will be rebuilt and will be tied in with a new rail spur facility which will allow the chlorine to be drawn into the system directly from railroad tank cars, each of which will hold an 18 to 20-day supply.

When the modernization job is completed—the contract calls for 600 calendar days—the pollution abatement goal, which seemed to many almost unobtainable nine years ago, will have been reached for practical purposes.

Since 1947, Rhode Island, nearby Massachusetts communities and the federal government have appropriated more than $30 million to lick the man-made pollution problem.

The funds have provided a large treatment plant in East Providence, R. I., built by the Blackstone Valley Sewer District Commission, to take wastes from Pawtucket, Central Falls and other Blackstone Valley communities.

Other treatment plants have been built in East Providence, Warren and Bristol, R. I., and in Fall River, Mass., which used to dump its raw sewage into Mount Hope Bay.

And only last week, a large plant in Newport, financed jointly by that city and the U. S. Navy, went into operation to treat ten to fifteen mgd of sewage which previously had been dumped into the bay.

Although there still are smaller local sewage problems to be dealt with, Walter J. Shea, chief of the State Division of Sanitary Engineering, estimates that when the Providence plant job is completed about two years hence, Rhode Island will have caught up with the pollution problem which at one time had threatened to make an open sewer out of Narragansett Bay.

Wide World Photo

Thaw of Western Snows Off in a Rush

The Pacific Northwest and small sections of Colorado had a water problem last week—too much of it—caused by rapidly melting mountain snows.

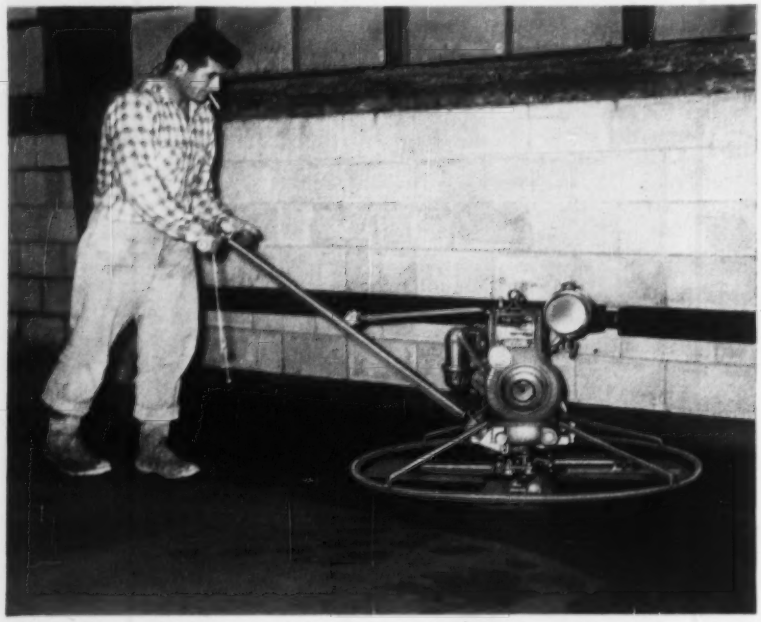
In Colorado at Georgetown Dam—10 mi west of Denver—a 60-ft section of the structure (see cut) was swept away, unleashing a boiling torrent down Clear Creek Canyon. The floods smashed out at least nine bridges and tore away a 100-ft section of U. S. Highway 6-40. The stream, which normally is kept to a wading depth by the concrete and earth dam, rose to 8 and 10 ft at the flood crest.

At the same time, the snowmelt-swollen Columbia River started acting up—endangering riparian communities in Washington and Oregon.

In the Portland-Vancouver, Wash. area the river was running about 12 ft above flood level and two small dikes had been washed out. High tides further complicated the picture in the lower course and were expected to back up the Columbia to only 6 in. below the protective dikes at Clatskanie, Ore., a small community approximately 50 mi northwest of Portland.

Concrete Finishing News

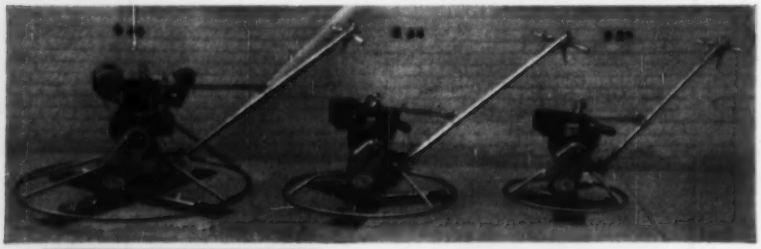
by STOW Mfg. Co.



On big concrete finishing jobs, it is important to know that the STOW G-46 Roto-Trowel will finish 5 more square feet per revolution than the G-34. This means that the G-46 can get the job done twice as fast. Notice that the G-46 Roto-Trowel has 4 blades for extra smooth trowelling. It has many important safety features, among which is the fool-proof, deadman clutch control on the handle that stops the blades from rotating the instant the operator releases pressure on the handle; a rugged, non-rotating guard ring lets you work up to and around walls and other obstructions.

When you strike off concrete, you can save money by using the STOW Vibrating Screed. You can use a denser, drier concrete, which means that trowelling can be started sooner.

For more information on STOW'S trowels and screeds, write today!



STOW MANUFACTURING CO.

19 Shear St. Binghamton, New York

Second Kaplan Is Installed At Gavins Point (S. D.) Dam

Workmen prepare to set in place the 250-ton No. 2 turbine at the Army Engineers' Gavins Point Dam near Yankton, S. D.

The runner is a Kaplan type with its five variable-pitch propeller-like blades. This is the only Kaplan-type installation at any of the Army Engineers' Missouri River dams (ENR Feb. 9, p. 51). All the other dams—Fort Randall, Garrison, Fort Peck and (in the future) Oahe—have or will have Francis types.

The runner is already in place on Unit No. 1. The first generator is scheduled to go on the line in October; the other two will follow four month intervals.

The dam project is 86% complete; powerhouse job is 70% complete, and workmen are putting the permanent roof on the powerhouse. The transformer and switch yard project is essentially complete except for the transformer.

The units at Gavins Point will turn out 33,333 kw each for a total of 100,000 kw.

Baldwin-Lima-Hamilton of Chester, Pa., has the $3.3-million contract for the three turbines. The three generators are being built by General Electric of Schenectady, N. Y., for $3,514,000.

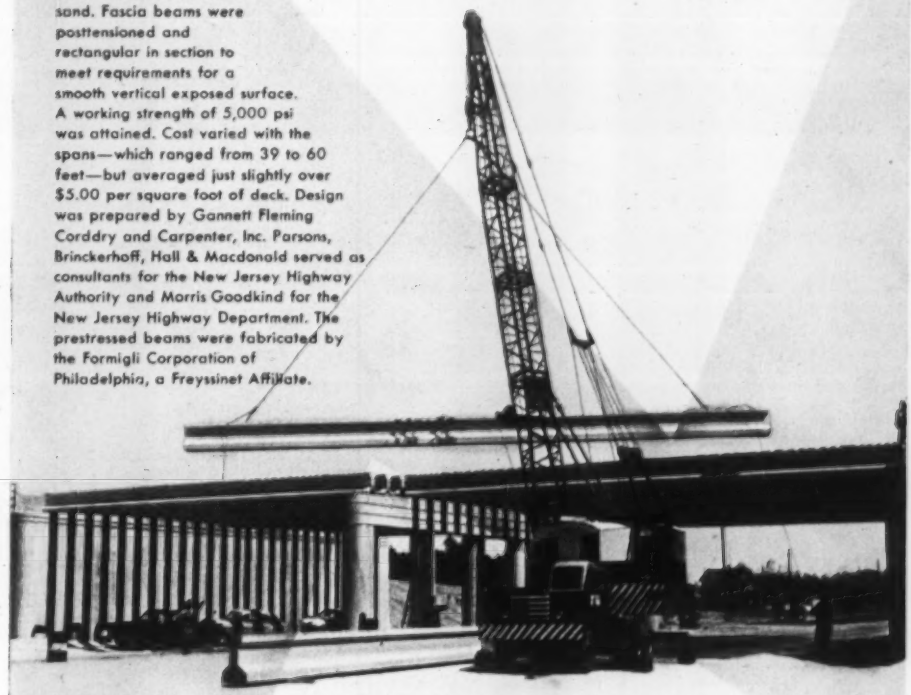
Private Sewage Company Plans Crop Irrigation

Incorporation has been started on a private sewage disposal company to serve the resort town of Scottsdale, Ariz., and the surrounding area. Western Waste Treatment Corp. is headed by Donald J. Adams, who now is chief construction engineer for the City of Phoenix.

Initial construction cost, including a disposal plant, will be approximately $250,000. Effluent of the plant will be used for crop irrigation.

The increase of subdivisions and several 300-room resort hotels in the area makes the plan practical—and profitable.

Pretensioned beams on this job eliminated falsework which would have had to be set on sand. Fascia beams were posttensioned and rectangular in section to meet requirements for a smooth vertical exposed surface. A working strength of 5,000 psi was attained. Cost varied with the spans—which ranged from 39 to 60 feet—but averaged just slightly over $5.00 per square foot of deck. Design was prepared by Gannett Fleming Corddry and Carpenter, Inc. Parsons, Brinckerhoff, Hall & Macdonald served as consultants for the New Jersey Highway Authority and Morris Goodkind for the New Jersey Highway Department. The prestressed beams were fabricated by the Formigli Corporation of Philadelphia, a Freyssinet Affiliate.



prestressed concrete

—best for modern high standard design

Speed of construction, economy and high quality resulted from use of 218 precast, prestressed deck girders in 12 bridges of New Jersey's Garden State Parkway.

Bridge construction is just one of the important applications where prestressed concrete is competitive and capable of meeting the most demanding engineering standards. Its many advantages apply equally to *commercial, industrial and school buildings.*

The Freyssinet Affiliates are well-qualified specialists in prestressed concrete—each operates a product plant equipped to manufacture *any type or size* of concrete structural unit on universal pretensioning beds. Highest standards of design are assured because every Affiliate retains the services of the Freyssinet Company—the most experienced consultants in prestressed concrete.

Your inquiries are invited on how the wide range of prestressed concrete products may serve you best. Simply *contact the Freyssinet Affiliate nearest you.*

FREYSSINET AFFILIATES

Goodstone Manufacturing Co., Inc.
470 Hollenbeck Street
Rochester, N. Y.

•

The Dextone Company
166 Chapel Street
New Haven, Conn.

•

Formigli Corporation
2050 Locust Street
Philadelphia, Pa.

•

Economy Cast Stone Co.
15 East Franklin Street
Richmond, Virginia

•

Ready-to-Pour Concrete Co.
P.O. Box 1075
Idaho Falls, Idaho

•

Empire Prestressed Concrete of Oregon
9255 N.E. Halsey Street
Portland, Oregon

•

Precrete, Inc.
130-01 Northern Boulevard
Corona, N. Y.

•

Lewis Manufacturing Co.
3044 S.W. 28th Lane
Miami, Florida

•

Precast Concrete Limited
P.O. Box 398
Calgary, Alberta, Canada

•

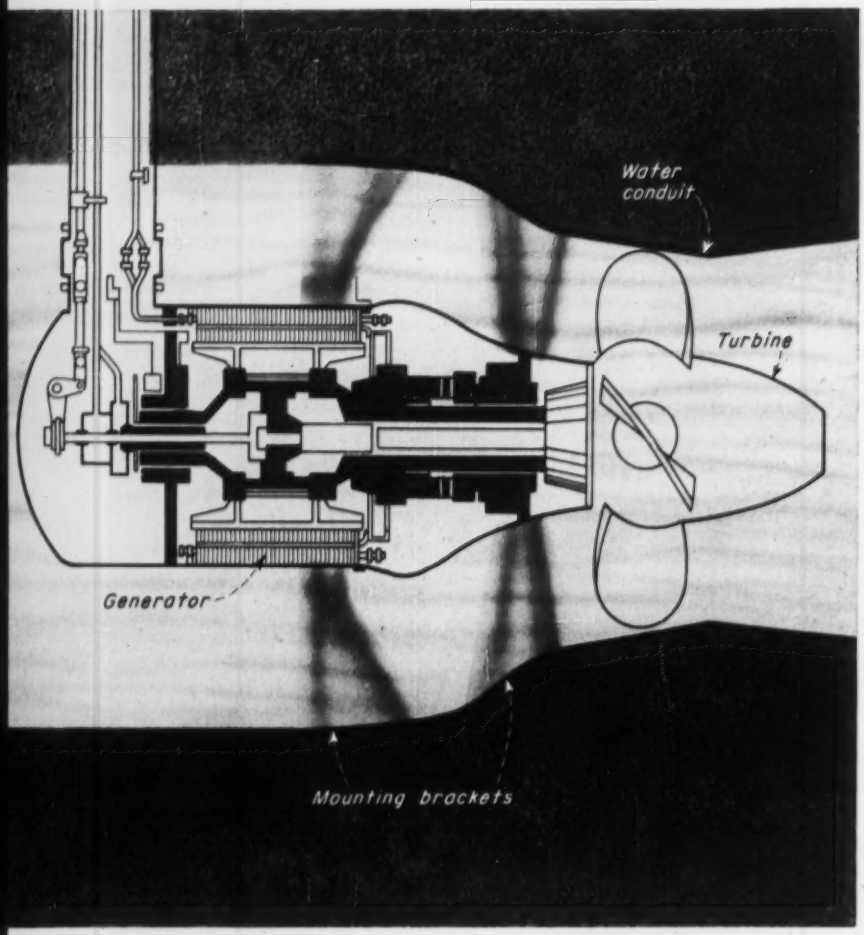
Schell Industries Limited
Woodstock
Ontario, Canada

•

Pretens, Inc.
Avenida Labra 800
Santurce, Puerto Rico

Power From the Tides?

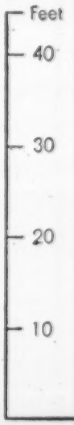
Countless paper studies and two never-completed attempts at construction represent man's ineffectual score to date in putting the tides to work to generate electricity. Now France enters the lists, and at one of the best potential tidal power sites in the world is planning construction of a plant that will use a combined generating-pumping cycle, made possible by a single, remarkable machine. Will it be a success? The French are betting $100 million that it will.



FRANCE'S SECRET WEAPON in the struggle to wrest big blocks of power from the tides is this novel turbo-generator, which can double as a pump. Completely submerged, it operates with the water flowing in either direction. Thirty-eight of the units, each of 9,000 kw capacity, are to be installed in a hollow-dam structure across the Rance River estuary on the Brittany coast.

Without Pump

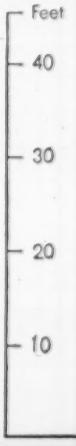
Utilizing the natural tidal flow into and out of a basin, the new axial-flow turbo-generator can produce power during two periods in every recurring 12-hr. tide cycle under a head varying from 15 to 20 ft.



Here are the steps in the operation →

With Pump

Power is again generated on both the rising and falling tide, but by inserting short periods of pumping—out of the basin on a flood tide and into the basin on an ebb tide—the head range is increased to 18 to 25 ft.

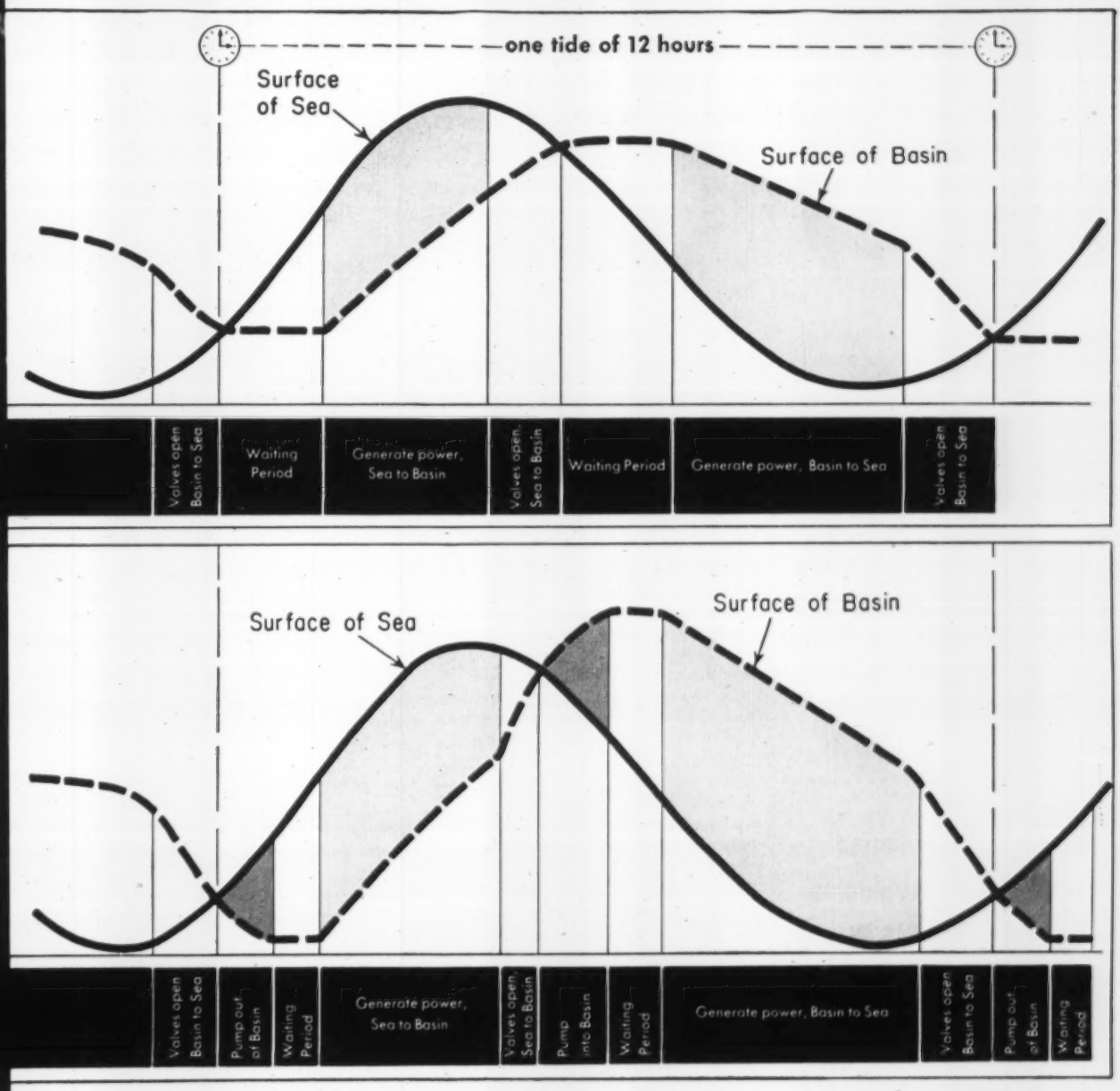


Here are the steps in the operation →

World's First

Waldo G. Bowman
Editor, Engineering News-Record

The dream of harnessing the tides to produce electric power, which has intrigued engineers for generations, seems about to come true in France. And, lending credence to the hope, French hydraulic engineers are convening in Paris this week for a Conference on Power from the Sea—a sort of a victory celebration to discuss the latest designs of a tidal project, which Electricite de France (EDF), the coun-


one tide of 12 hours
Surface of Sea
Surface of Basin
Valves open Basin to Sea
Waiting Period
Generate power, Sea to Basin
Valves open, Sea to Basin
Waiting Period
Generate power, Basin to Sea
Valves open Basin to Sea

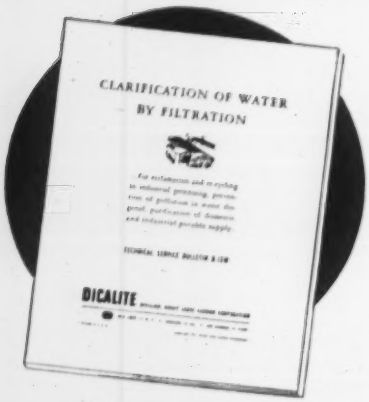
Tidal Power Plant Begun

try's power authority, is placing under construction on the English Channel coast in Brittany. Destined to be the world's first installation to produce network electric power from the tides, it is scheduled for completion in 1963 to add 800 million kwh to the French power supply from its 342,000 kw of generating capacity.

To be located on the estuary of the Rance River just upstream from the town of St. Malo, this remarkable installation will literally owe its existence to a new type horizontal-axis-turbo-generator of relatively small size. For this unique machine was actually developed in just the nick of time to relieve a grave doubt that a Rance tidal plant design completed in 1951, and using conventional vertical axis turbines, would pass economic muster; it generated power only on the ebb tide and, with the 26 power units of 8,000 kw, which could be fitted into the 2,300 ft width of the river, could only be counted on for 550 million kwh per year.

The new horizontal-axis machine, set directly in the line of flow and completely submerged, has the special advantage of being able to generate power with the water flowing in either direction, and in addition to function as a pump as well as a turbine. Thus it can be used to generate power on both ebb and flood, while its pumping function can be utilized to raise or lower the levels of the reservoir beyond those attained normally, and thus increase the available head for the turbines. This will produce an additional 130 million kwh per year, or a net 100 million kwh after deducting the power consumed in pumping.

Because these new power units are relatively narrow (about 18 ft at the maximum diameter) more of them can be fitted into the width of the



These FREE Bulletins provide much valuable data on WATER FILTRATION

. . . industrial reclamation or recycling, waste disposal, and purification of potable water supply. B-12W is largely industrial; F-552 concerns potable supply. Write to

Dependable
GREAT LAKES
GLC Dicalite
DIATOMACEOUS MATERIALS

Dicalite Division • Great Lakes Carbon Corporation, Dept. E
614 South Flower Street
Los Angeles 17, California

. . . Good site plus novel turbine

river. As now designed, therefore, the Rance plant contains 38 of these turbogenerators, each rated at 9,000 kw or 12,000 hp. This increased capacity, plus the additional power production periods and the increased heads from pumping, permits the plant's net output to be raised to 800 million kwh. Moreover, since the units, as well as the operating rooms and maintenance shops, are installed in the body of the dam itself, there is no actual powerhouse superstructure—which effects a saving over vertical shaft turbine installations. The top of the dam will also serve as a highway bridge, which is badly needed since the nearest available crossing is 20 miles upstream.

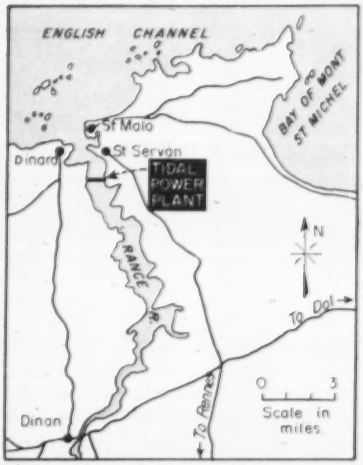
Work began on the Rance power plant site in 1954 with the construction of access roads, workers' quarters and a hydraulic model laboratory. In July of last year bids were asked on the construction of the plant, and the award of a contract is scheduled for this Summer.

In the meantime, EDF has ordered several of the turbo-generators for installation in two low-head river plants (at Cambeyrac, on the Truyere River, 9,400 hp under 35 ft head; and at Argentat on the Dordogne River, 20,000 hp under 55 ft head) to give the manufacturer experience in making them and to study them in service. One of the units will also soon be placed in an unused navigation lock channel at St. Malo for additional field tests.

It may also be noted that, independent of EDF, the French National Railways has installed two of the units in its Castet plant in the Pyrenees. Of 1,100-hp size and operating under a 24-ft head, they have been in successful service for nearly 2 years.

• **Why the Rance?**—The choice of the Rance estuary for the site of a tidal power plant was made by EDF after long study of available sites in France, including comparison with investigations which had been carried out elsewhere in the world. A great deal of information is available because wherever relatively high tides occur in locations where they could be trapped by dams, even remotely possible of construction, someone has studied the situation.

In France these locations abound on the English Channel coast of Brittany, and numerous private companies have tried to exploit several of them. The highest tides, 41 ft, occur in the large Bay of Mont St. Michael just



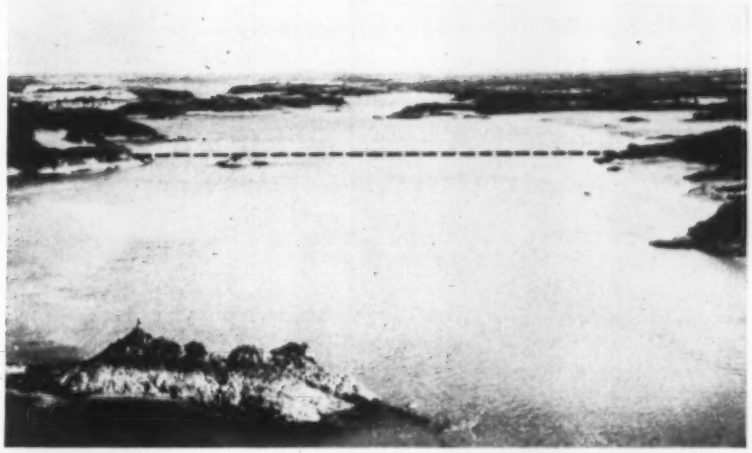
LOCATION of Rance plant. A much bigger one is a dream for Mont St. Michel Bay.

north of St. Malo, but the Rance estuary is not far behind at 37 ft. Tides at numerous other locations, north and south of the Rance, range from 15 to 30 ft, but the dam sites are less favorable.

Actually, the only other places in the world with tides of the magnitude of those around St. Malo are in the Severn estuary in England and the Bay of Fundy in Canada. The Severn's tide reaches 38 ft, and numerous studies have been made of power possibilities there. However, the twin difficulties of silting behind any dam in the Severn, and the large amount of navigation that uses the port of Bristol have, to date, discouraged any definite project. The Bay of Fundy, at least that part in Canada, has a tidal range of 52 ft, by far the largest in the world. A report was made in 1945 on the utilization of the Fundy estuaries of Petit Codiac and Memramcook for a double basin project, but nothing definite came of it.

Cobscook Bay, location of the ill-conceived U. S. Passamaquoddy tidal power scheme of 1935, is also a part of the Bay of Fundy, but the tides there have a range of only 24 ft. In this connection it is to be noted that there is general agreement on the good possibility of developing a satisfactory tidal power plant in this area if all the arms of the Bay of Fundy can be considered regardless of the international boundary. This is the proposition now being investigated by the International Boundary Commission and the U. S. Corps of Engineers (ENR Feb. 9, 1956, p. 22).

Many more sites around the world have been studied, but at only two has any construction been done, and in neither case did it progress very far. At Aber Wrac'h on France's Brittany coast, a private company



TIDAL RESERVOIR SITE in the Rance estuary is above the dashed line which indicates the location of the 2,300-ft power plant structure.

started work in 1928, but abandoned it because of financial troubles in 1930. The U. S. government's Passamaquoddy project was started in 1935 and abandoned in 1936 because it could not stand up to economic analysis.

Considered from the twin viewpoints of potential economic success and of the practicalities of construction, the Rance is probably the best site for a tidal project anywhere in the world. It has the additional advantage to France of offering a proving ground for a vastly larger tidal plant—on the order of 10 to 15 million kw — which could be built in neighboring Mont St. Michael Bay by creating a 244 sq mile basin behind a 20 mile long dam. Improbable as such a project may appear to be, it is being actively studied by EDF. In the meantime the Rance project is no ordinary size undertaking itself, but one whose practicability seems assured by the availability of a new turbine-generator particularly suitable to tidal power generation.

• **New turbo-generator the key**—It is nevertheless a remarkable circumstance for a commitment to be made for a $100 million project that depends for its success on the functioning of an entirely new machine. Yet that is what the engineers of Electricite de France have done with great confidence and considerable justification. Developed in France simultaneously by Etablissements Neyrpic and Societe Jeumont, the new machine is referred to as a "monobloc", since both the turbine and the generator are mounted in the same housing—but more generally, is called a "bulb unit" because of the shape of the end of the housing containing the generator. And it is from tests in the Neyrpic laboratory at Grenoble and from functioning of the first two units in the Castet plant referred to above, that the conviction has been established that it is the answer to the tidal power plant's needs.

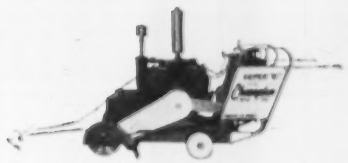
• **Progressive development**—The bulb unit, however, while new, does have some antecedents and ancestors. These have been reviewed in a report on tidal power plants by Robert Gibrat, EDF consulting engineer, who, after noting that horizontal axial-flow turbines for low-head river plants are at least a hundred years old, gives credit for the development of the first modern turbo-generator of that type to the late L. F. Harza, consulting engineer of Chicago.

In 1919, Mr. Harza applied for a patent (granted in 1924) on a machine in which the turbine blades were fitted with a ring on which the rotor poles were mounted, and with the stator wound around the outside of the turbine housing like a belt. This idea was exploited before the war by a German engineer, Arno Fischer, in several low-head power plants on rivers in Bavaria, which were said to be successful but experienced difficulty in keeping the joints in the units watertight.

A second predecessor was developed by Neyrpic in the 30's, with tidal power plants in mind, in which the generator, mounted on the shaft ahead of the turbine, was enclosed in a well to isolate it from the water. One of these types is being installed by EDF at the Argentat plant (referred to above where a bulb unit is also installed) to secure service experience.

The final step in the progressive development of a successful axial-flow machine was to enclose the generator

Champion Offers NEW CONCRETE CUTTING EQUIPMENT . . .



Powerful direct chain drive eliminates slippage and maintains constant torque on Champion's new 36 h.p. concrete saw. This unit also has a revolutionary new type clutch — plus a host of other features you'll want to know about.

Tungsten Carbide diamond blades, by Champion, have an extremely tough bond that generally causes them to outlast ordinary diamond blades 2½ to 1. Contractors everywhere are trying this blade with great success.

When speed of cut is of top importance, contractors choose Champion concrete cutting diamond blades. Available in several specifications. Your dealer can help you select the proper blades for the aggregate you want to cut.

Use this coupon to send for more information.

Champion Manufacturing Company
2028 Washington Avenue
St. Louis 3, Missouri

Please send more information about

- ☐ 36 h.p. Concrete Saw
- ☐ Tungsten Carbide Blades
- ☐ Diamond Blades

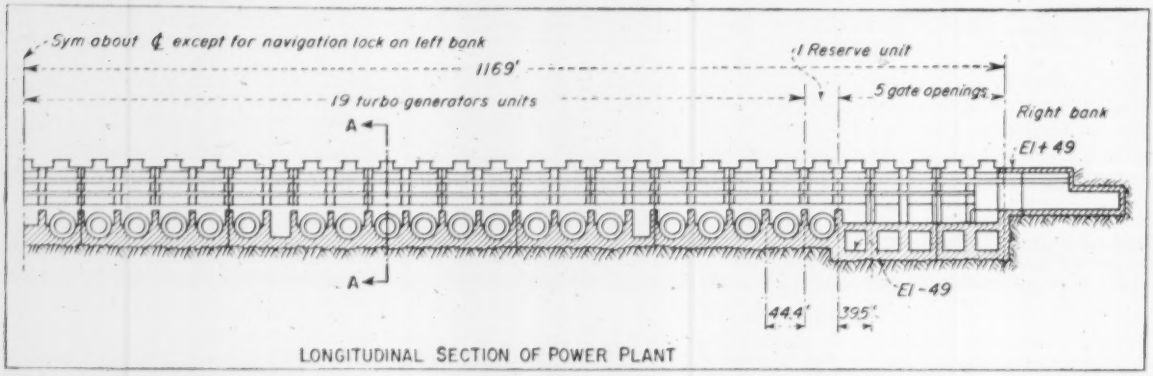
Name _____

Address _____

City & State _____

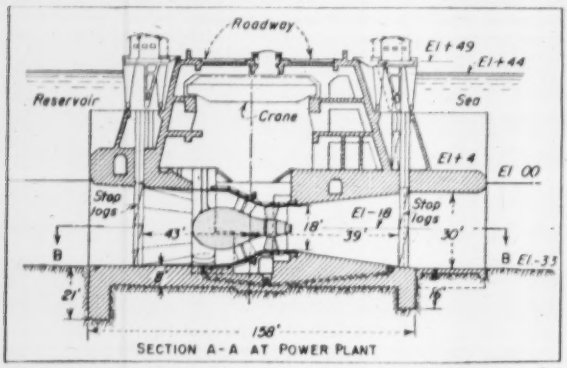
2

. . . Tidal plant is both a design and construction challenge

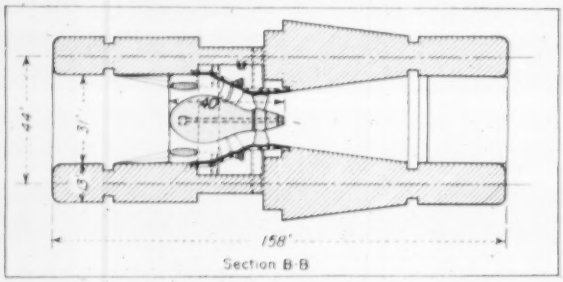


LONGITUDINAL SECTION OF POWER PLANT

RANCE TIDAL POWER PLANT will be in the form of a hollow dam containing openings for 38 power units and 10 gates to aid in filling and emptying the reservoir. The new type self-contained turbo generators can be installed or removed for repairs in a matter of hours.



SECTION A-A AT POWER PLANT



Section B-B

in a bulb-shaped watertight housing attached to the turbine. The German, Arno Fischer, is believed to have made the first installation of one of these type units in a plant at Rostin about 1942, but experienced difficulty because of condensation from air vapor inside when it was cooled by the water flowing over the outside of the bulb.

At about this same time, Neyrpic, working with a French professor of electrical engineering, M. Guimbal, was also developing a bulb unit, which resulted in the successful installation at Castet. In this unit the condensation problem was solved by using oil as the interior cooling fluid. Thus, the oil in which the rotor operates transfers the generated heat to the wall of the stator bulb which is cooled by the water flowing outside. However, it is now felt that the use of oil as the cooling fluid would probably limit the capacity of the units to something in the neighborhood of 1,000 hp, so air at atmospheric pressure or perhaps compressed gas is to be used for larger units, such as those required for the Rance plant.

• **Light weight**—One of the important advantages of these new turbo-generator units is that their weight is only about half that of a conventional vertical axis machine; also because of this relatively light weight, the units can be installed or removed for repairs in a matter of hours.

Their use will also permit both the height and area of the powerhouse to be reduced, effecting a construction cost saving claimed to be as much as 35%.

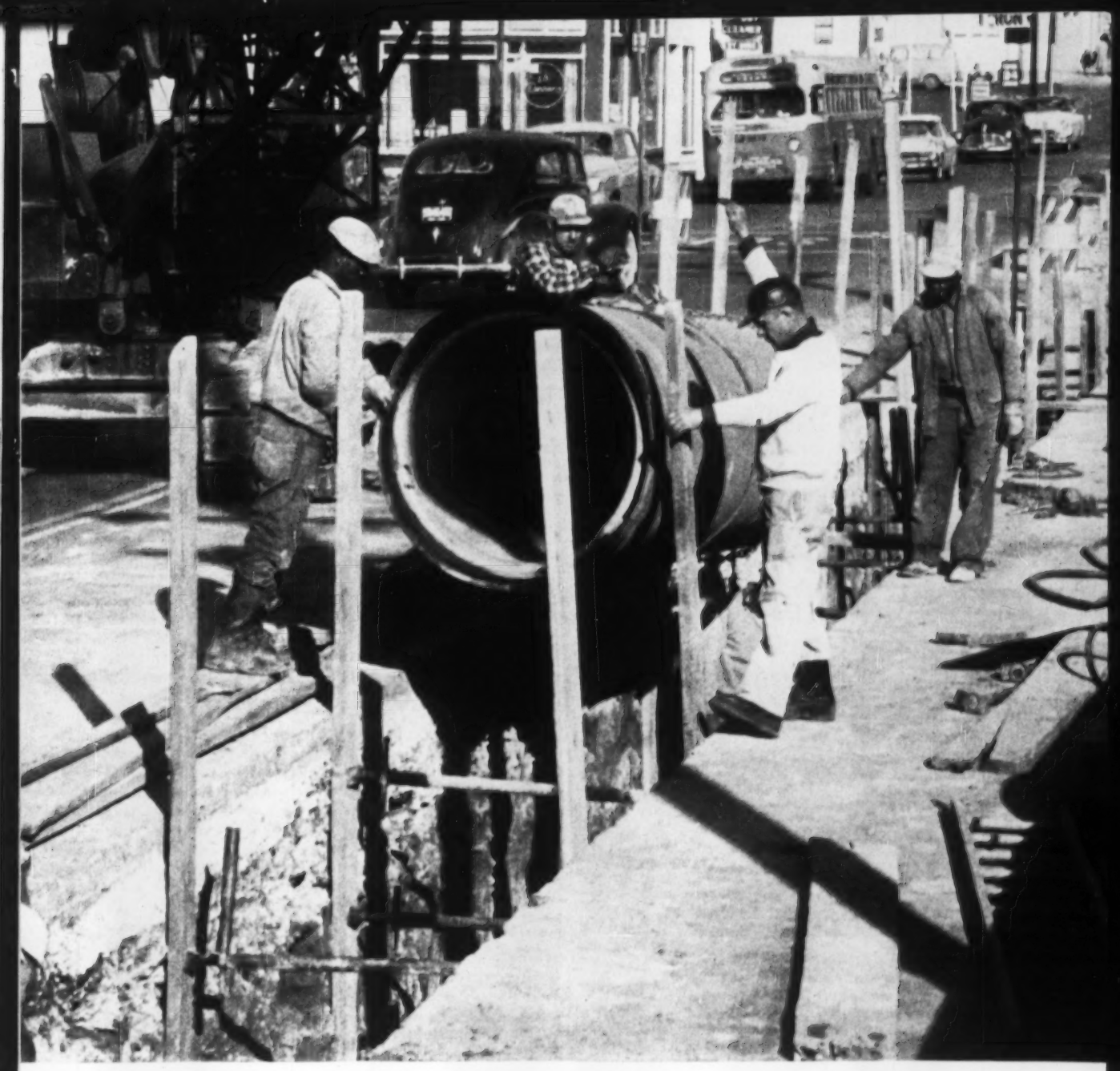
These are advantages which would be present in any low-head run-of-river project, but for a tidal plant the bulb units have the even more significant quality of being able to operate with water flowing in either direction, or, when required, to operate as pumps instead of turbines.

How this special quality of the units is planned to be used in the Rance plant is illustrated in the accompanying diagram covering a single tide cycle of 12 hours. Actually the two examples shown are merely indicative of the almost countless combinations of pumping, power generation, waiting and emptying and filling periods that can be employed with the various movements of water possible. These water movements include in or out of the basin by "turbinage", in or out of the basin by the pumping, and in or out of the basin through gate openings.

This ability to choose different methods of operation is claimed to be perhaps the greatest advantage of the bulb units for tidal power generation, since it permits adapting the production of energy to the demands of a particular hour, day or season, or to the price that the energy commands at various times should that be variable. Since the amplitude of the tides changes with different lunar periods, different plant operating combinations can also be chosen for maximum efficiency.

• **The Rance plant**—The installation in which these operations will be carried out is under construction at the first narrow point in the estuary upstream from St. Malo and the adjacent towns of St. Servan and Dinard. The structure, which is both a dam and a power plant, will be approximately 2,300 ft long and 160 ft wide and will rise about 85 ft above the bottom of the estuary. The roadway across its top will be at El 49, five feet above the highest tide, which incidentally occurs only once every 18 years, although the reservoir level will no doubt frequently be raised to that level by pumping.

The structure will be in the form of a tunnel pierced transversely by



Price

Concrete Pipe for Cincinnati's Montgomery Road

Montgomery Road is a main artery that feeds into Cincinnati from the northeast. It carries a heavy load of traffic, so when an extension of a 36-inch water supply line was planned, ease of installation was an important consideration.

Prestressed concrete cylinder pipe turned out to be a happy choice. The job went smoothly for the contractor, A. F. Jelen & Son Co., and the highway was kept open to traffic even through congested districts like the one in the picture. Basic reason was the steel-and-rubber joint which is made quickly and easily . . . and incidentally makes a bottletight, yet flexible joint that is designed to take heavy traffic loads.

The line is 11,000 feet long and includes both 30 and 36-inch pipe. Along with 620 standard 16-foot lengths, the contractor installed 16 bends, 2 wyes, 3 reducers, 3 tees, 2 closure assemblies, one cross, and a number of short lengths and bevel adapters.

For information on any type of concrete pressure pipe for either water supply or pressure sewer lines, write Price Brothers Company, Dayton, Ohio.

EXTRA STRENGTH and DURABILITY ...for Your Rock Drills and Other Heavy Duty Air Tools

"SUBWAY"®

"Standard of Quality"

"Subway" is built with that *extra* measure of strength and durability that assures uninterrupted delivery of maximum air power to the drills, ever when the "going" is roughest. Light weight, flexible, easy to handle. Specifications include oilproof tube; highest quality wrapped duck carcass; wear- and weather-resistant red rubber cover, with new criss-cross yellow stripe for positive identification. Sizes ½" to 1¼", I.D., in maximum lengths of 50 feet.

EXTRA SAFETY ...for Your Caissons and Manifolds

"Standard of Quality"

"ALLGOOD CORD"®

"Allgood Cord" . . . long famous for its outstanding strength and safety for three most important air hose applications—supplying air to caissons where human lives are at stake; feeding air to Jumbos where a shutdown would affect not one but a battery of drills; and as a main air line to shovels in tunnel headings. Specifications include black synthetic tube; special kink-resistant wrapped duck carcass; wear-resistant white rubber cover.

"Allgood Cord" is made in sizes 1½" to 4", inclusive, in maximum lengths of 50 feet.

"If it's GOODALL, it MUST be Good!"

Contact Our Nearest Branch for Details and Prices

Standard of Quality—Since 1870

HOSE · BELTING · FOOTWEAR · CLOTHING AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches and Distributors Throughout the United States and in Canada

penings, in 38 of which turbo-generators will be installed, while 10 additional ones, five at either end, will be closed by hydraulic lift gates. The upper level of the "tunnel" over the lift gates will be devoted to maintenance and assembly shops, and a bridge crane will operate the length of the tunnel to install and remove the turbo-generators. A navigation lock will be built on the left bank. About 615,000 cu yd of concrete is estimated to be required for the entire installation.

Construction of the Rance tidal power plant will require the building of an enormous cofferdam since equal protection must be provided both on the sea and reservoir sides. Also provision must be made to pass the entire tidal flow four times each day and in such a way as to minimize effects on tide levels both up and downstream. When it is noted that the tidal discharge sometimes reaches the tremendous volume of 650,000 cfs and that a sizeable current is almost always present, the magnitude of the job becomes clear.

According to present plans, U-shaped enclosures made of rockfills with steel sheetpile cores will first be pushed out from either bank, and the end portions of the power plant, corresponding to about half its total length, constructed within. The sides of these enclosures will then be removed, permitting the tides to move through the openings in the completed part of the structure as well as in the center part of the channel. This channel will then be closed by another cofferdam utilizing the ends of the first cofferdams as two of its sides.

Extensive model studies have been under way in the hydraulic laboratory which is located on the site in order to determine the best type of cofferdam wall and the most practical method of final closure.

The present schedule envisions that 8 to 10 generators can be placed in service in 1960, 8 to 10 more in 1962, and that in 1963 all 38 can be operating.

• **Administration**—For Electricite de France, work and studies have been placed under the joint authority of MM. Ailleret, Directeur General des Etudes et Recherches and Olivier Martin, Directeur de l'Equipement. M. L. Vantroys is head of the studies division, and M. G. Surrel is its chief at the project site. M. Aurov is head of the works division, and M. Souille its chief at the project site.

M. R. Gibrat, consulting-engineer, has been given the job of coordinating all the matters connected with tidal power research, design and construction for Electricite de France.

Goes places a standard station wagon can't . . . carries up to 50% more payload!

Take a good look at the new Dodge *Town Wagon*—the ideal low-cost vehicle for your business! It's a double-duty carrier of passengers, cargo, or *both*. And with Forward Look styling it's as handsome as it is versatile!

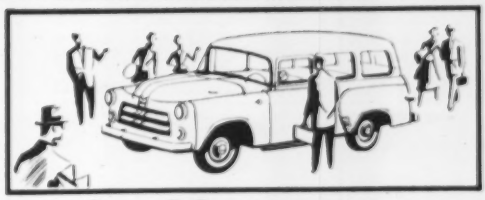
The *Town Wagon* is built on a rugged ½-ton Dodge *truck* chassis, giving you extra ground clearance for off-the-road driving. It's powered by either the famous Dodge L-head Six or the new Power-Dome V-8.

With seats in place, one model carries six passengers, the other eight. In the six-passenger model you've got about 90 cubic feet of load space in the rear compartment. The same amount of space is available in the eight-passenger model with the rear seat removed. You can also take all extra-passenger seats *out* of either model, leaving clear, unobstructed room for a big, truck-size payload of 1575 pounds.

You can see . . . and *drive* . . . the *Town Wagon* at your Dodge dealer's now.

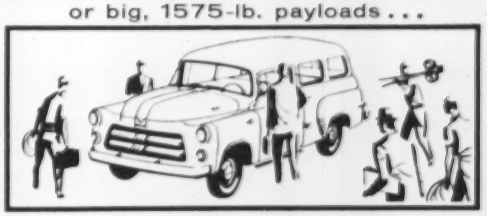
DODGE TOWN WAGON

WITH THE *FORWARD* LOOK



Carry 6-8 passengers . . .

or big, 1575-lb. payloads . . .



or passengers plus cargo

MAIL TODAY!

Advertising Department D—Dodge Division
Chrysler Corporation
P.O. Box 1259—Detroit 31, Mich.

Please send me more information and complete specifications for the new Dodge Town Wagon.

Name _____

Street address _____

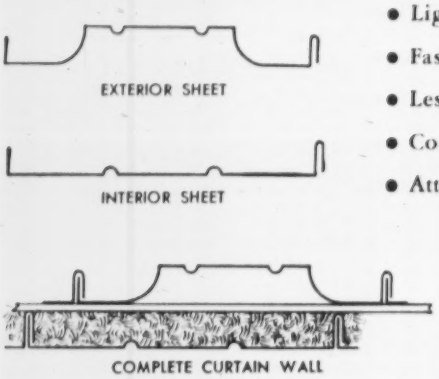
City _____ Zone ____ State _____

For rapid construction plus eye appeal . . .

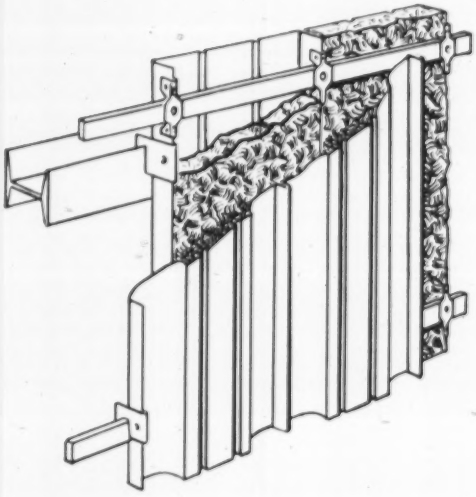
select NEW STRAN-STEEL CURTAIN WALL

Now your buildings can have structural soundness as well as a fresh, attractive appearance with Stran-Steel curtain walls. Exclusive *Stran-Satin* finish gives you a satin-smooth, highly decorative surface and the added protection of a non-corrosive zinc coating. And, of course, the eye appeal of these *Stran-Satin* panels is combined with the low cost and extra strength that only steel can offer. For wall or fascia construction in all types of public buildings, specify Stran-Steel curtain wall.

Stran-Steel curtain wall panels offer these advantages . . .



- Light framework
- Fast, easy to assemble
- Less heat loss
- Complete wall insulation
- Attractive appearance



56-SS-14C

Stran-Steel Corporation
Ecorse, Detroit 29, Michigan

☐ Please send me the new Stran-Steel Structural Systems catalog

☐ Please have your representative contact me

Name_____

Company_____

Street_____

City_____ Zone____ State_____

D

STRAN-STEEL CORPORATION

Ecorse, Detroit 29 Michigan • A Unit of

NATIONAL STEEL CORPORATION

Here's where to obtain Engineering Service:

Atlanta 3, Ga., 206 Volunteer Bldg.
Cleveland 15, Ohio, 20950 Center Ridge Rd.
Detroit 29, Mich., Tecumseh Rd., Ecorse
Houston 5, Tex., 2444 Times Blvd.
Minneapolis 4, Minn., 708 S. 10th St.
N. Kansas City 16, Mo., 1322 Burlington
San Francisco 5, Calif., 215 Market St.
Washington 6, D.C., 1200 18th St., N.W.

Dealers in more than 40 principal cities

Next step in prestressing concrete . . .

Pretensioning With Deflected Strands

Ross H. Bryan
Consulting Engineer
Nashville, Tenn.

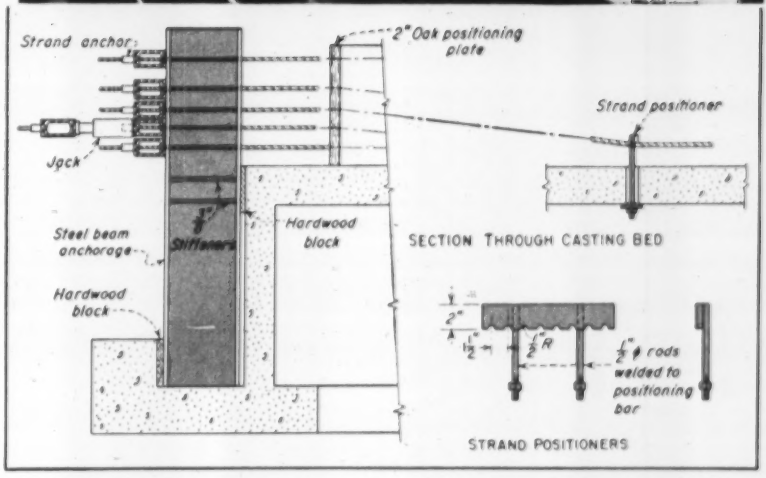
Present concepts of the relative economy of pretensioned and post-tensioned concrete are due for a change. Development of a new technique—placing strands in a vertical curve in pretensioned beams—now makes long-span pretensioned members cheaper than post-tensioned.

The two fabricating methods generally used differ principally in the order of tensioning and concreting and in the means of transferring stress from steel to concrete. In pretensioning, prestressing elements are stretched between external anchorages and then embedded in the concrete member. When the concrete attains sufficient strength, the steel is released from the anchorages, transferring the stress to the concrete through bond. In post-tensioning, prestressing elements are placed in preformed holes in the concrete and stress is transferred through anchorages at the ends of the member itself.

When the steel is draped in a vertical curve under tension, the compressive stresses it creates in a beam can be made to vary along the span in about the same way as the tensile stresses from loads causing bending. As a result, the prestress counteracts stresses from loads along the whole length of the beam. Thus, curving the prestressing elements is a very efficient technique.

Advantage has been taken of it for most long-span post-tensioned beams. However, straight steel has been used until recently for pretensioned beams, because the steel is stressed before the concrete is cast. As a result, such members are not as economical for long spans as post-tensioned beams with draped elements. Development of a technique for draping strands in pretensioned beams is the next step in prestressed concrete.

Actually, the method, as now being used, is simple: A strand-positioning device is placed at points where the strands are to change direction and is either supported on or tied to the casting bed. Hold-downs are bolted to the casting bed and remain permanently in the beam. After the tension on the strands is relieved, transferring the prestress to the beam, the nuts on the hold-down bolts are removed, permitting the beam to be removed from the bed. Later, portions of the bolts that project are burned off.



DEFLECTED STRANDS under tension stretch between anchorages at the ends of a casting bed for a pretensioned beam. Casting bed takes the forces from the strand positioning device (arrow in photo) bolted to it.

• New period beginning—The era during which prestressed concrete was used regardless of cost, because it was a new and exciting material, has ended. If prestressed concrete is to be sold to the present-day builder, it must be competitive with the more commonly used construction materials.

Introduction of any new building material requires a period of proving and experimentation. During this time, soundness and adaptability are tested, and designs are developed to make the most economical use of the material in completed structures. In the case of prestressed concrete, it was natural for early American designs to be patterned after the proven designs that had been developed previously by European engineers. This procedure was necessary to gain design experience quickly and safely. During the last few years, however, American engineers have developed designs and methods of their own that are better adapted to the facilities of the American construction industry than were the earlier European methods.

Growth of plant fabrication of prestressed concrete has been rapid in the U.S., and has demanded the utmost in economy of design and construction from the engineers serving this new industry. The construction industry is depending more and more on plant fabricators to furnish a fixed cost for prestressed members fob job-site, and in many cases, in-

place. To meet the economic pressure, plant fabricators have turned to pretensioned, bonded construction to hold costs to a minimum.

• **Enter curved strands**—Until recently, fabrication of large bridge members was considered a job-site operation. In fact, many of the larger structures being built in the U.S. today involve either a combination of pretensioning and post-tensioning or entirely post-tensioning at the job site. But now, use of bonded, deflected strands in the production of large members is coming into the picture and rapidly changing the economic concepts of design and fabrication previously established for post-tensioning methods. Fabricating plants are producing large members with pretensioned, deflected strands, which several years ago would have been post-tensioned on the job site.

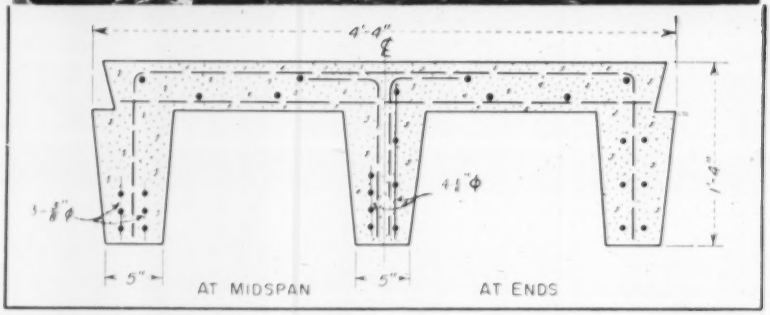
Pretensioning was originally developed for small members. Prestressing elements were small wires. But the American strand has made possible bonding of larger prestressing elements and thus the production of larger members. (We are currently using ½-in. strand and are planning to shift to ⅝-in.) However, the concentration of a large prestressing force in the bottom flange of a large beam for its entire length is highly undesirable. Use of deflected pretensioning strands overcomes this difficulty and accomplishes the effect of a draped post-tensioned element at less cost.

• **Added benefits**—Deflected, pretensioned strands have other advantages, of which greater shear resistance, better distribution of anchorage forces, reduced strand requirements and less camber are among the more important. In continuous structures, curved strands are a necessity, because the strands must be raised above the center of gravity of the beams at the ends of each span to prevent overstressing the bottom flange under negative moment.

Pretensioned, deflected strands were first used in the production of prestressed roof channels by the Nashville Brecko Block Co., Nashville, Tenn., in the early part of 1953. Since that time, their use has been extended to the production of large beams and girders.

• **Fabrication requirements**—Fabrication of pretensioned members with deflected strands requires a special type of bed. It must be capable of resisting the vertical forces from the positioning devices that deflect the strands. This bed does not necessarily need to be of great length. In the fabrication of both bridge and building members, it has been found that production of beams and girders on short beds can easily keep pace with production of the elements that span between the beams and girders.

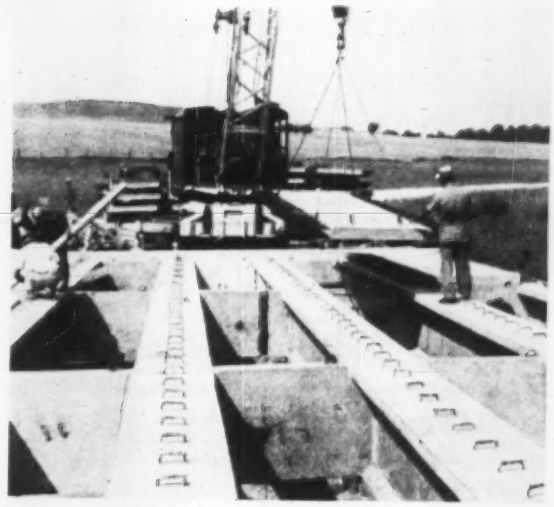
For example, for a building with 40x50-ft bays, 2,000 sq ft of channel slabs per bay would be required. If plant production was based on 2,000 sq ft of channel slabs per day, the total length of channel fabricating bed required would be approximately 700 lin ft. However, only one girder need be produced per day to keep pace with fabrication of the channels. It is therefore obvious that a bed that would produce two girders per day would be adequate to keep pace with the production of a fairly large fabricating plant.



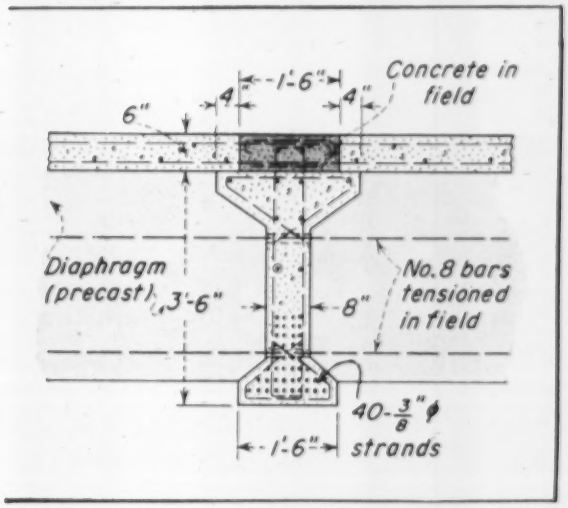
SHORT-SPAN BRIDGE of continuous construction is made of pretensioned units with deflected strands. Units have a channel-shaped cross section. Dimensions given are for a 20-ft clear span, H20 loading, 5,000-psi concrete.

• **Continuous construction**—To obtain the greatest economy from any structural design, it is important that all the possibilities of the design be used. In the design of building or bridge structures of reinforced concrete or structural steel, it would be unusual for a competent engineer to consider the use of simple-span construction for a multispan structure. It should also be unlikely for the same engineer to consider the construction of a multispan structure with simple spans of prestressed concrete.

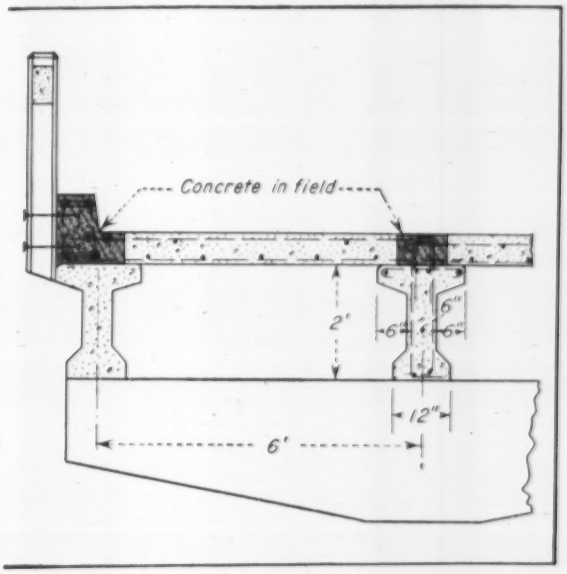
Continuity may be established in a number of ways. It may be partial or full continuity under dead or live load. It may be established by field post-tensioning methods, or by cantilevered and suspended spans, or it may



CONCRETE I-BEAMS, pretensioned with deflected strands, span 81 ft in a highway bridge. Precast slabs form the deck. Continuity of slabs and composite action between girders and slabs is achieved by embedding projecting steel in cast-in-place concrete. Transverse prestress is applied through precast diaphragms placed between the girders.

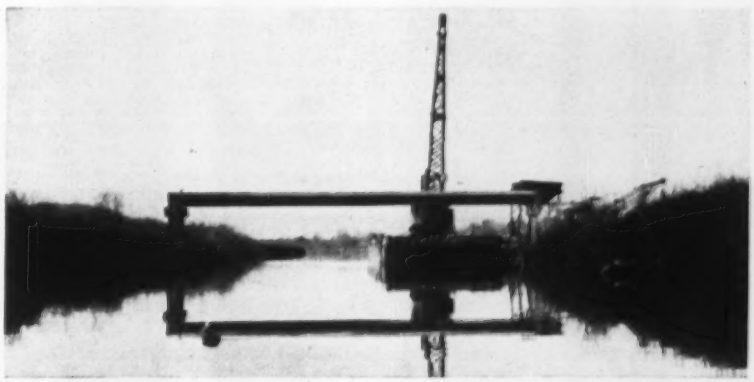


CONTINUOUS GIRDERS of 50-ft span are seated on precast pier caps welded to pier steel. Steel dowels projecting from the cap later were embedded in concrete to anchor the girders.

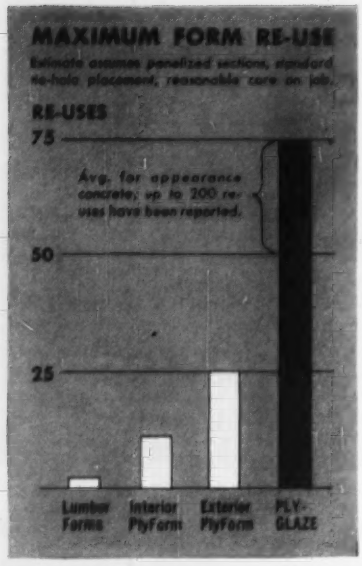


COMPOSITE CONSTRUCTION is secured for continuous girders by placing negative-moment steel between precast deck slabs and tieing the bars to the girders with stirrups.

SIMPLE-SPAN GIRDER with 80-ft span has integral top slab.



OVER A RIVER, T-beam shown at left was erected by a crane on a barge. Similar beams placed side by side form the complete superstructure.



50 to 75 is a good average, but with care you can get up to...

200 RE-USES with PLYGLAZE®

CONCRETE FORM PANELS

PLYGLAZE'S tough, hard surface stands up indefinitely under repeated concrete pourings. PlyGlaze forms are worn out only when the panels are cut into unserviceably small pieces. With proper design and care you should get 50 to 75 re-uses. Actually, *over* 200 have been obtained—even then PlyGlaze continues to form good-looking concrete.

TREE LIFE FOREST PRODUCTS
Another member of the famous Tree Life Family of Forest Products
Hard, glossy-smooth wear resistant fused resin-fiber surfaces.
Top-quality Exterior plywood (EXT-DFPA). Standard panel sizes.

ST. PAUL & TACOMA LUMBER CO.
Dept. ENR, Tacoma 2, Wash.
Please send free PlyGlaze literature.

Name .....

Address .....

City ..... Zone ..... State .....

be accomplished by incorporating mild reinforcing steel into the members in the field by welding or concreting blocked-out sections.

Use of mild reinforcing steel to establish continuity is a procedure that is thoroughly understood by all contractors and does not entail an additional cost for unfamiliarity with the work. The design of a prestressed structure made continuous with reinforcing steel can be carried out by any engineer familiar with continuity. In many cases, it is possible to balance the positive and negative moments within reasonable limits by proper construction sequence.

• **Economy in design**—There is an economical design in prestressed concrete for any bridge structure that can be constructed in reinforced concrete or steel plate girders. The economy will be more pronounced if the spans lie within range of plant fabrication. In some cases, the lengths may approach 125 ft where barge or rail delivery is possible. The writer has designed girders that have been shipped by rail and truck in lengths up to 100 ft.

To obtain the greatest economy, the basic design section must be compatible with the span and loading required. Local conditions will vary the span limitations of any particular design section to some extent. Generally speaking, bridge members that fall within the range of plant fabrication are classified as short bridges or long bridges, and a special design section for each condition should be used.

For short bridge spans (from 15 to 40 ft) the channel section is probably the most economical. It can be economically produced in depths of 8 to 18 in. One of the attractive features of this type of construction is the elimination of all field concrete work, although the driving surface may not be all that is desired unless the channels are topped with a wearing surface.

To bring about an effective and economical design, the individual channels must be prestressed transversely and must have an effective keyway, which is grouted in the field after the channels are placed and prior to transverse prestressing. The keyway performs two functions; it aids in transmitting shear between adjacent slabs and provides a transition for smoothing out camber differences between the slabs.

Where multiple spans are required, continuity can be established by means of mild reinforcing steel. This type of structure should be placed on simple, sliding bearing plates of asbestos-cement or other suitable material, to eliminate expensive bearing cost.

Where longer spans are required—30 ft to 150 ft—slab-and-girder type of construction is probably the more economical design. All elements should be precast to obtain the most in economy. To establish a favorable cost, details of construction must be worked out so that the assembly will go together easily and quickly in the field.

The slabs and the girders must be bonded together so that composite action is obtained under live load. This is essential from the standpoint of continuity and stability and long life of the structure.

Where more than one span is required, continuity of the girders should be established. Where possible, the interior piers should be flexible enough so that the girders may be fixed on the interior piers and expansion devices required only at the abutments. This will eliminate expensive bearing and rocker details and simplify erection.

All the structures illustrated were fabricated by the Concrete Products Division, T. L. Herbert & Sons Co., Nashville, Tenn., of which J. F. McCaul is general manager.

Record-Output (450,000-kw) Generators to Be Installed

American Gas & Electric Co. will install two 450,000-kw generators. Each will cost $55 million, and each is claimed to be 73% bigger than any unit operating in the world today.

No announcement has been made as to which plants will house the two giant steam turbine-generator units but it is probable they will go to two of three operating subsidiaries: Appalachian Electric Power Co., Ohio Power Co., Indiana & Michigan Electric Co.

Only a large system would have use for a 450,000-kw unit; it is enough to supply needs of 4,000,000 people.

Such a jump in unit size—from 260 mw to 450 mw—is made possible by advances in oil and hydrogen forced cooling of rotors and stators.

General Electric will build the two turbine-generator units. Babcock & Wilcox Co. will supply their two boilers, each to consume 1,300,000 tons of coal a year.

Film on The Dalles Dam

A 28-minute sound color movie on planning, design and construction of The Dalles Dam is available for screening by groups in Pacific Northwest.

The film is obtainable on loan from the film library of the Division Engineer, North Pacific Division, Corps of Engineers, 210 Custom House, Portland 9, Oregon.

FROM BRUNING – Your One Convenient Source for All Drafting Needs...

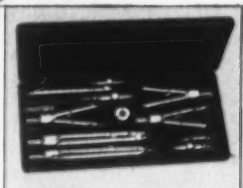
5 "Thrifty Nifties"

That Will Save You Time, Work, and Money!

Little things mean a lot in drafting! That's why the five outstanding, low-cost drafting aids featured here are important to you. That's why they and many products like them are important members of Bruning's complete quality line. Try them; you'll be mighty pleased at how fast the savings of time and labor mount up!

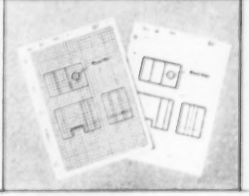
BRUNING ELECTRIC ERASING MACHINE
Save hours of finger-cramping manual erasing. Do a neater, safer erasing job. The patented hollow shaft permits use of extra-long, seven-inch eraser, prevents "fly-outs". These quiet, cool, vibration-free tools are permanently lubricated, require no maintenance.

BRUNING VARSITY DRAFTER
Costs a few dollars more than conventional T-Square, triangle, and protractor; lets you make neater, more accurate drawings . . . up to 25% faster. Full circle protractor and indexing clamp permit scales to be set quickly and precisely to any desired angle. For drawings to 24"x30". Ideal for shop drawings, home use, students.



WILD STAINLESS STEEL INSTRUMENTS
Now, get the higher precision, lifetime durability and beauty offered only by the instruments made entirely of stainless steel. They will not oxidize, can not be damaged by perspiration. Specially hardened, swivel-type pen nibs are exceptionally durable, easy to clean. Swiss precision-made. Moderately priced. Handsome metal cases.

PHENOLIC BLADE T-SQUARE
Get the lasting trueness, durability, and beauty of modern plastics in this moderate-priced T-square. The warp-proof, practically indestructible blade is made of laminated phenolic plastic, with a life-like maple finish. Drawing edges of crystal clear acrylic plastic are relieved for easy, safe ruling with ink; will not discolor or become brittle.



No. 697 CROSS SECTION PAD
This handy, time-saving cross section pad lets you draw to scale . . . make sharp copies without cross section lines. Cross section lines are printed in light blue, will not reproduce. Pads are available with or without pre-printed heading containing fill-in blanks for basic data. Cross sections come 4x4, 5x5, 8x8, 10x10 squares per inch.

Take a minute now to mail the coupon. Save yourself hours of time and work later on.

BRUNING

America's Leading Supplier of Engineering and Drafting Equipment.

CHARLES BRUNING COMPANY, INC., 4700 MONTROSE AVE., CHICAGO 41, ILL.

In Canada: Charles Bruning Company (Canada) Ltd., 105 Church Street, Toronto 1, Ontario

Charles Bruning Company, Inc., Dept. 64-M
4700 Montrose Ave., Chicago 41, Illinois

Please send me information on these Time-and-Work Savers:

☐ Electric Erasing Machine ☐ Varsity Drafter ☐ Wild Instruments
☐ Phenolic T-Square ☐ Cross Section Pad

Name _____ Title _____

Company _____

Address _____

City _____ County _____ State _____

Engineered for

World's most heavily traveled turnpike

The 118-mile New Jersey Turnpike, constructed with modern asphalt pavement, carried 25,888,319 cars and trucks in 1955. No other turnpike is so heavily traveled, yet this asphalt-paved superhighway is one of the safest heavy-duty roads in the world. Its 1955 safety record of 2.76 fatalities per 100 million vehicle-miles is far better than the 6.5 average for national highways.

ASPH

smooth, rugged service!

IN FOUR SHORT YEARS total traffic volume on the asphalt-paved New Jersey Turnpike has exceeded the total carried during the 15-year life of the Pennsylvania Turnpike, the grand-daddy of present-day toll roads.

Yet in spite of carrying more traffic than any other turnpike in the world, maintenance costs are low and the asphalt pavement is in excellent condition.

To highway engineers the New Jersey Turnpike's record of tremendous traffic and outstanding safety is a remarkable demonstration of the dependability of modern asphalt pavements for rugged, heavy-duty service.

Modern asphalt pavement saved $50,000 a mile on the New Jersey Turnpike. For one thing, material costs were less because, as is usually the case with asphalt construction, economical use was made of local soils and aggregates. This is one of the many benefits of asphalt's versatility. Also, asphalt construction is faster. Thus the road begins to earn revenue sooner.

Modern, heavy-duty asphalt construction is demonstrating that it offers economy, durability and ease and speed of construction. That's why more engineers are recommending asphalt pavements—engineered for smooth, rugged service.

Engineered for rugged wear

TYPICAL SECTION showing modern 4½" asphaltic concrete pavement on New Jersey Turnpike. Pavement structure designed from the ground up for axle loads of 36,000 lbs. Bids on asphalt design were $5,000,000 less than bids for 10" rigid pavement to carry the same loading.

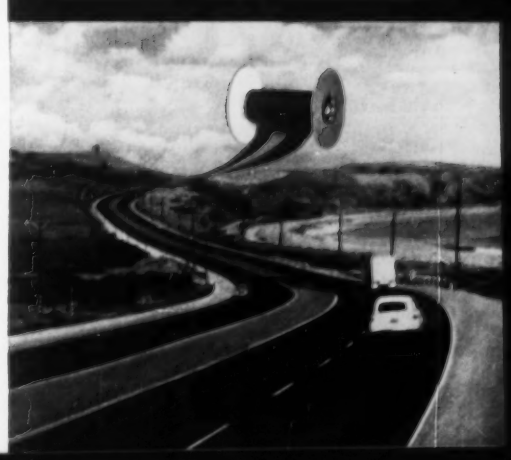
4½" Asphaltic Concrete
7½" Asphalt Penetration Macadam
6½" Compacted Stone or Gravel Subbase

THE ASPHALT INSTITUTE
Asphalt Institute Building, College Park, Maryland

ALT

FOR MODERN HEAVY-DUTY HIGHWAYS

RIBBONS OF VELVET SMOOTHNESS...



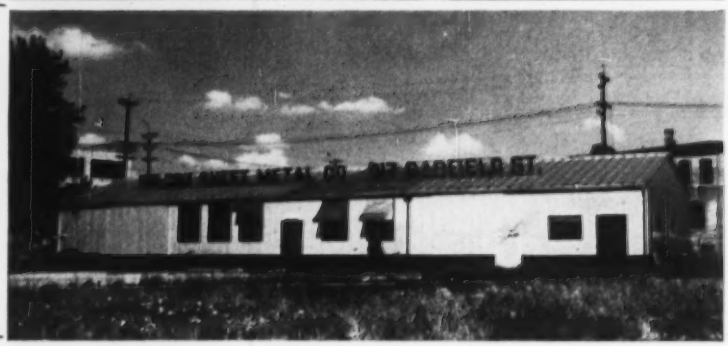
Owner Says "EXPANSION IS EASY WHEN YOU OWN AN ARMCO BUILDING"

Pictures Show How He Enlarged Building as Business Grew

Office and shop of Wilcox Sheet Metal Company, Middletown, Ohio, was erected in 1949. The original Armco Building was 28 feet wide by 60 feet long.

By 1951, more floor space was needed. Owner, G. W. Wilcox, reports the expansion was easy. He simply ordered roof and wall parts for a 29-foot-long extension. Some of the original endwall panels were left in place to provide a partition, some of them were moved to the endwall on the addition.

With the addition completed, it is practically impossible to tell the old from the new. The result, an attractive, weather-tight building, big enough for today's business—and ready to be extended again if need be.



You need never outgrow an Armco Steel Building. STEELOX Panel construction makes it easy to rearrange your building to fit new conditions, add more length, relocate doors and windows, or erect a companion span. Building parts are inventoried to help you do the job quickly and conveniently.

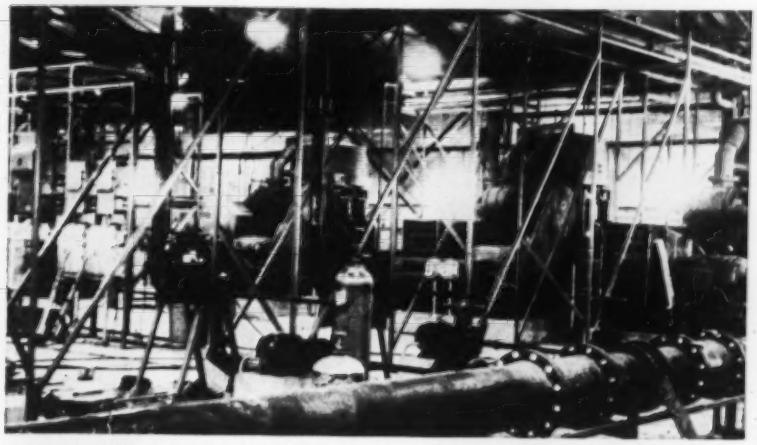
Write for Complete Information

Tell us about your building needs. You can meet practically any floor space requirement with an Armco Building. Lengths and widths are unlimited. Clear-span widths up to 60 feet. Armco Drainage & Metal Products, Inc., 5046 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO STEEL BUILDINGS

ARMCO®

PIPING WATER from frozen lake was found preferable to . . .



DISTILLATION OF SEA WATER by costly and complicated equipment.

Water Supply for Thule

Col. Morton Solomon
District Engineer
Eastern Ocean District
Corps of Engineers

Before Project Blue-Jay—the Thule airbase—native Danes and Eskimos in Greenland had secured fresh water from ponds in summer and by melting ice in winter. But in order to construct the airbase at Thule, Army engineers had to provide a water supply for a large group of men.

Four sources of water were investigated by the Army and consulting engineers Metcalf & Eddy. All had inherent disadvantages.

The first was melted snow and ice. The Greenland ice cap offered an unlimited supply of fresh water, but it was far away and it was frozen. To establish a melting plant near the ice cap, some 10 or 15 miles from the base, and then haul the water in trucks, would be very expensive. In 1951, ten 250-gph portable, oil-fired, water-heater type ice melters were secured for emergency use. These were not used at the Thule base, but were eventually installed at off-base installations.

The second source considered was deep wells. It was reasoned that the weight of the ice cap generated heat at its base, and that the cap therefore melted from beneath, providing a source of groundwater in unfrozen soil; wells near the edge of the ice cap might produce fresh water in abundance. This theory was investigated; several shallow wells were drilled in the bed of a stream flowing from the ice cap. In addition, one hole was drilled to a depth of 1,000 ft—and the cores were still frozen. The well theory was abandoned.

The third source was natural ponds that glacial action had left scattered about the landscape. At first, in 1951, these ponds were considered only as a temporary source of water for summer use by the constructors; they were considered too shallow to serve as a permanent supply. However, success of the 1951-1952 use of ponds led to their later development as a permanent supply in 1953.

The fourth source, distilled sea water, was determined in 1951 to be the only practicable source of fresh water of an approved quantity and quality at Thule. Original plans called for salt water distillation plants to supply the base. One major distillation plant was established, but difficulties and cost of operation led to the location and development of reliable surface supplies and final adoption of the small lakes as the most economical fresh water source.

To provide water for the men during the first outdoor construction season, a line of 6-in. steel invasion pipe was laid from Lake Eddy and brought some three miles down to the beach by gravity flow.

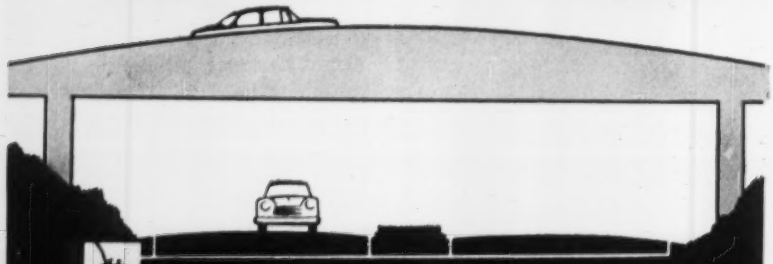
After completion of the base's runway and north taxiway, Lake Eddy was cut off from its limited watershed. Invasion pipe was laid from a pumping station on North River, a distance of about a quarter of a mile, and during the summer seasons of 1952 and 1953, the lake was kept filled by pumping. (So convenient was the location of this lake for providing water to the airbase, the Air Force asked that the temporary installation be transferred to them intact.)

• **Find permanent supply**—Success at Lake Eddy in supplying the base with water prompted additional search for a larger and more suitable lake nearby. Choice settled on Crescent Lake, situated some five miles northeast of the airbase. This lake is about a half-mile long by 500 ft in width. Its average depth is about 20 ft. In 1952, a low dam of rock-and-earth fill was constructed across the eastern end of the lake to increase its capacity, and a diversion canal was dug and equipped with regulating facilities to provide for diversion of water from North River to refill the lake during the summer season.

When the lake is full, it is estimated to contain some 173 mg of water at an elevation of 436 ft. Normal runoff from snow melt will recharge the lake. While it freezes during the winter months, approximately two-thirds of its contents are available for use.

A short jetty was constructed into the lake to allow for an under-ice intake, and a pumping station was built on the jetty with insulated pipe connections to the treatment plant on shore. The treatment plant includes three heated truck-fill stalls (water distribution is by tank truck), a large treatment room containing three 25,-

For UNDERPASS DRAINAGE



SUBMERSIBLE EJECTOR

New! with 6" DISCHARGE!

A "Big Brother" to the famous 3" and 4" Pumps

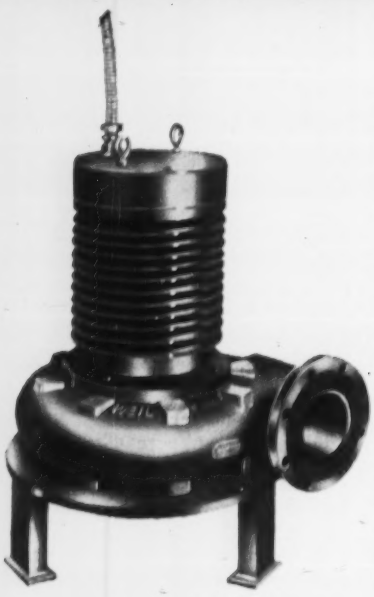


FIG. SE-890

NO PUMP HOUSE REQUIRED
Capacities to 2000 GPM

The new ejector designed for completely submerged operation is constructed with the same engineering features that have made the 3" and 4" Submersible Ejectors so trouble-free and efficient. It can be supplied with 5" or 6" discharge, with heads to 70 feet and capacities to 2000 GPM.

The new pump has been developed to answer the need for low cost installations where large quantities of water must be drained quickly. It is particularly adapted for highway underpass drainage and is designed for continuous operation during flood periods. The NON-CLOG Impeller will handle 3½" solids.

Can be supplied with control systems having no moving parts in the pits. Multiple installations are furnished with controls to program the operation for load requirements.

CONSTRUCTION FEATURES:

Motor and bearings are hermetically sealed. The motor, housing, drive shaft and impeller – all of the working parts – are an integral and interchangeable unit and can be removed without disturbing the piping. They are not subject to corrosion, deterioration or injury when standing idle—regardless of weather conditions.

The NON-CLOG Impeller is of manganese bronze; pump shaft stainless steel; permanently sealed ball bearings; volute type casing of nickel iron; motor windings of special design and construction are permanently non-corrosive; motor housing machined and sealed to exclude dirt and water.

Ask for Bulletin SE 860 C

weil PUMP CO.

1528 NORTH FREMONT STREET • CHICAGO, ILLINOIS

000-gal wooden tanks, a mechanical room with steam boilers for heating, a laboratory and office space. Water is treated by the introduction of limestone, ferric chloride and calcium hypochloride at a solid contact clarifier called an erdlator (ENR Sept. 24, 1953, p. 39) which produces a clear effluent. Ferric chloride is the coagulant. Limestone aids in the flocculation by raising the alkalinity and furnishing a nucleus for floc formation. Calcium hypochloride is the disinfectant.

The erdlator effluent is pumped through a pressure sand filter to remove floc particles and other foreign matter that escapes the erdlator. Although farther removed from the airbase than the distillation plant, and necessitating a longer haul by the water trucks, the treatment system has proved the solution to the Thule's water supply problem.

• **Truck haul a problem**—In spite of the problem of securing a safe and sufficient source, Thule Air Base has not been short of water due to source deficiencies. The chief problem has been in distribution of water throughout the base of a fleet of 1,800-gal water trucks. The tanks of these trucks were insulated so as not to require additional heat to prevent freezing until the advent of sub-zero weather; when it goes below zero they are kept warm by a diesel blowtorch within a flue at the rear of each tank. Hoses are kept from freezing by placing end nozzles in the tanks and circulating the water with a pump located in an insulated, electrically heated box. The treated water is fed into the heated tanks of these trucks, and they distribute it throughout Thule Air Base.

. . . And Thule Waste Disposal

Disposal of sewage at Thule is also radically different. All waste water is collected and stored in tanks within buildings, and is disposed of by heated tank trucks which haul it to a central point.

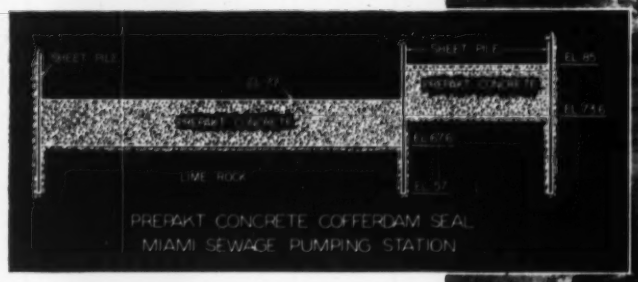
Disposal from this point consists of electrically heated and insulated sewer lines above ground, a jetty, a comminutor building and an underwater outfall. From within the comminutor building, the outfall drops vertically to the bottom of the bay and continues along to a point of discharge 300 ft offshore.

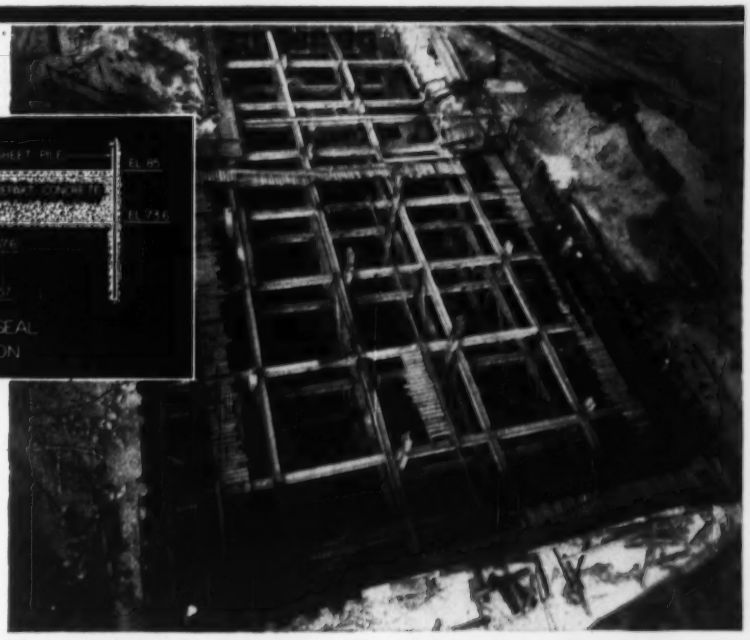
This system can accommodate a peak flow of 1.75 mgd and provides for contemplated future installation of a complete sewage collection system. The tank-truck handling method was an expedient for the initial base development. Future planning is for ultimate development of heated pipelines for sewage collection.

Owner: City of Miami, Florida
Engineers: Connell & Rader Associates, Miami
Contractor: DeFonce Construction Co., Inc.

EXCAVATION FULL OF WATER **was situation met by INTRUSION-PREPAKT. This was the best that usual dewatering methods could do.**

Conventional dewatering methods failed





DRY COFFERDAM **was produced by underwater placement of PREPAKT concrete cofferdam seal, later used as base for the structural slab of the building.**

but Intrusion-Prepakt had the answer

INTRUSION-PREPAKT solved a difficult dewatering problem at the N. E. 9th St. Sewage Pumping Station, Miami, Florida. A close-to-the-surface water table plus a porous lime rock substrata produced a water flow that the contractor could not lick with usual methods.

A PREPAKT concrete cofferdam seal, placed underwater directly on rock, provided a water-tight joint and a tight structural tie-in with the sheet piling. This halted water leakage and resulted in a dry cofferdam.

PREPAKT concrete is made by consolidating preplaced aggregate with INTRUSION mortar—a method which eliminates dilution and other weaknesses to give a strong, monolithic structure. On this job, the PREPAKT seal withstands a 36-foot hydrostatic head. Made underwater or in the dry, PREPAKT concrete is of superior quality, has virtually no shrinkage, embeds reinforcing thoroughly and seals without need for after-grouting.

To save time and money on your next difficult foundation or structural concrete problem, contact: INTRUSION-PREPAKT, Inc., Room 779-N, Union Commerce Bldg., Cleveland 14, Ohio. In Canada: INTRUSION-PREPAKT, Ltd., 159 Bay St., Toronto, Ontario.

INTRUSION-PREPAKT, INC.

OFFICES IN PRINCIPAL U.S. AND FOREIGN CITIES

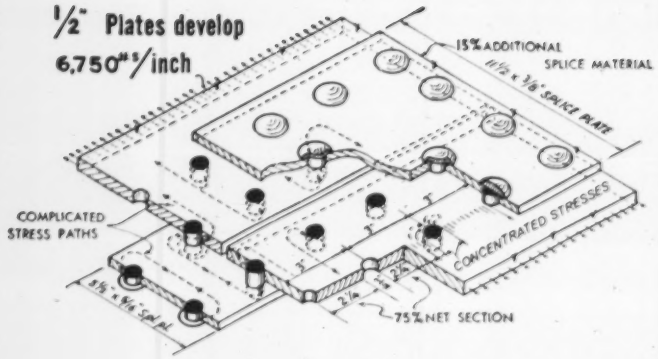
Intrusion and Prepakt are trade marks of Intrusion-Prepakt, Inc., whose methods and materials are covered by U. S. Patents Nos. 2,815,031, 2655034, 3434302 and others, also patents pending.

When steel frames can be simplified . . .

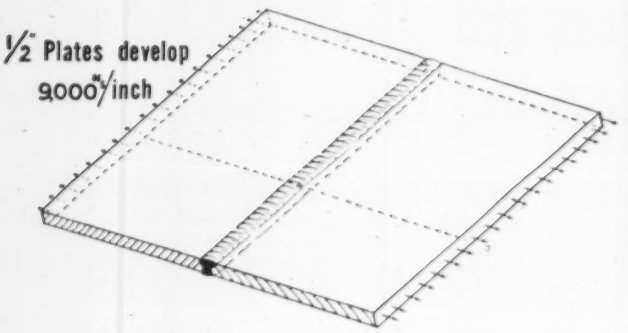
Have more useable space . . . better appearance . . .

Yet erected for less cost . . .

WHY shouldn't you design for welding



TYPICAL RIVETED JOINT—*Requires punching, splice plates and rivets*



TYPICAL WELDED JOINT—*Provides continuity of original section . . . eliminates stress concentrations*

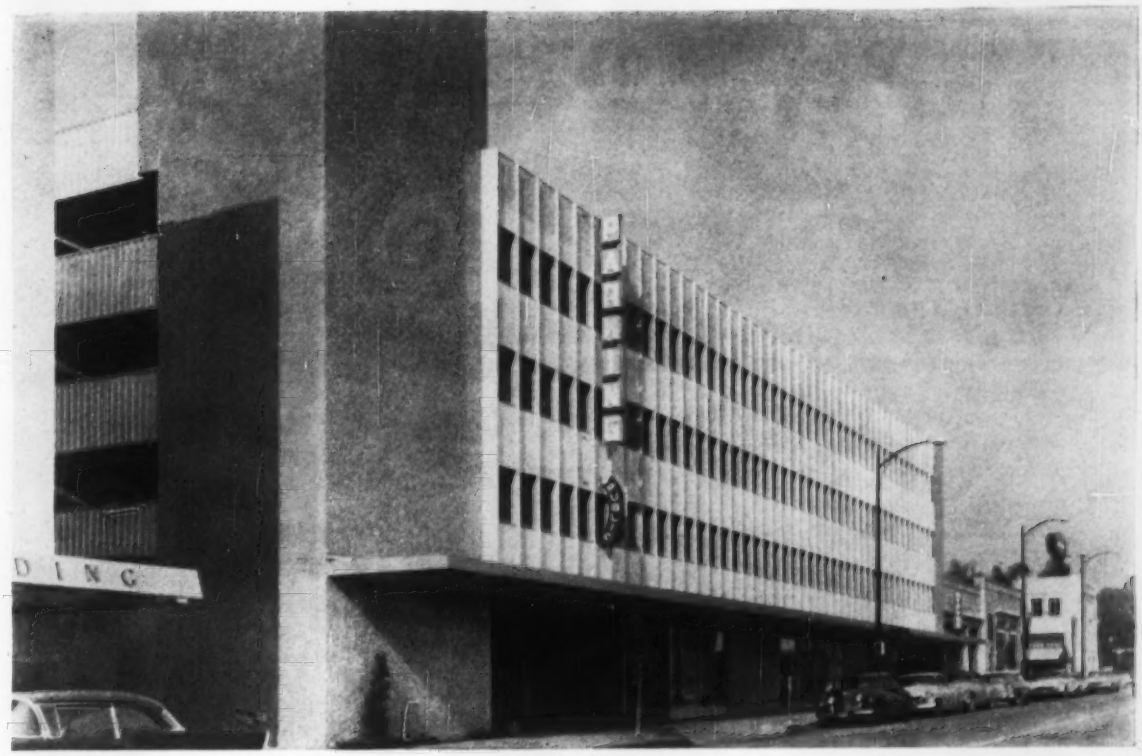
WHY punch holes in structural steel . . . only to fill them with rivets.

The same structural connection can be simplified, fabricated for less cost, erected in less time by arc welding.

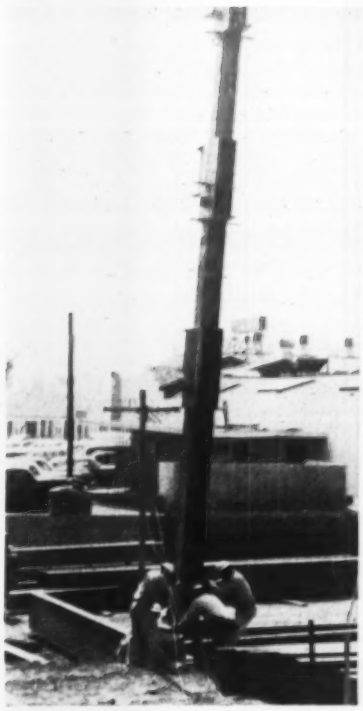
How you benefit by welded design is presented in Lincoln Studies in Structural Arc Welding . . . available to designers and engineers by writing

THE LINCOLN ELECTRIC COMPANY
Dept. 2316 • Cleveland 17, Ohio
Pioneer in welded structural design . . . for lower cost

© 1956 The Lincoln Electric Company



Welded Garage Has Treelike Columns



TREELIKE COLUMNS were wide-flange sections with stub beams welded on.

A new five-story parking garage in Beverly Hills, Calif., squeezes the most parking space out of the least area, and cost a mere $3 per sq ft. Chief element in achieving low construction cost is the efficient, continuous steel frame, with shop welded beam-column connections.

First the builders faced a design headache, later a contracting problem, then finally a construction obstacle. But in spite of all, the structure was built in 125 working days.

Called the National City Bank Annex, the new garage occupies a 22,000-sq ft lot. The five-story structure contains 117,000 sq ft of floor area: 106,000 sq ft to park about 400 cars; 6,000 sq ft for lobbies, services and car pools; and the remaining 5,000 sq ft is leasing area.

General design of the structure consists of a series of levels (four plus a roof level). Between floors are connecting parking decks sloping at a 5% grade. This is the key to the building's high parking efficiency, since very little floor area is lost because of ramps—elevation is gained, instead, in the parking areas.

• **Three obstacles**—Poor soil conditions were the design problem—only 2,000 psf was available for bearing. This dictated as light a structure as possible, with each column supported on a caisson 20 ft. deep.

The contracting problem arose from the fact that the total order of 350 tons of steel was too small for the big fabricators to bother about, yet too much for any small fabricator to handle with promptness. Since the job was a rush—delivery time short—the barrier was overcome by purchasing from five different fabricators.

The construction obstacle was a city ordinance. Beverly Hills would not permit the delivered steel to be stacked in the street. To meet this requirement, steel for one section of the building was delivered and put up before proceeding to the next. A mobile crane with a 70-ft boom erected steel.

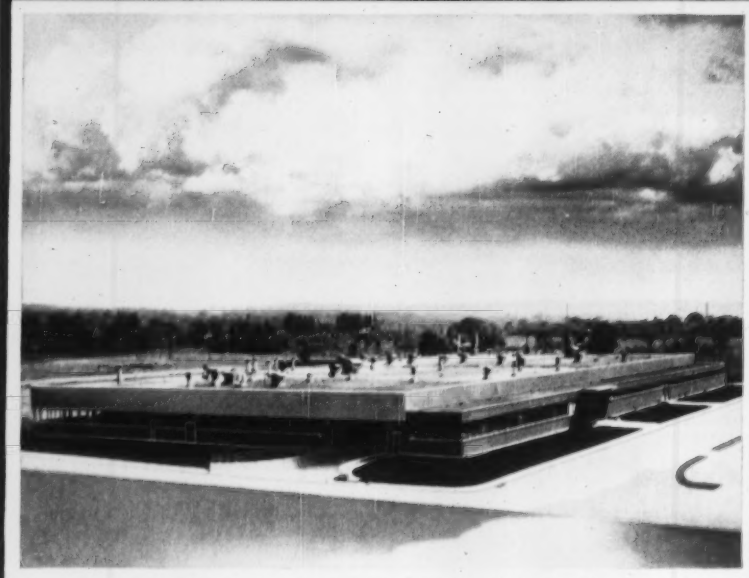
• **Treelike columns**—A rigid-frame design was employed for the building's structural system. Columns were building-high, wide-flange sections, with stub beams welded on to them at each floor level. Consisting of built-up sections of two flange plates and a web plate, stubs gave the appearance of sawed-off limbs of a tree.

The bottom flange plate of the stub

Since HOPE'S 1818

STEEL WINDOWS HAVE THE STRENGTH AND RIGIDITY THAT NO OTHER WINDOW CAN MATCH

Lok'd Bar FACTORY SASH



New Super-Precision Plant for the Marlin-Rockwell Corp., Falconer, N. Y.
Wigton-Abbott Corporation, Engineers-Contractors

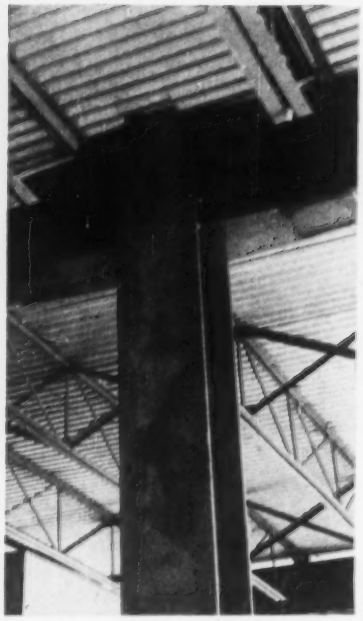
274 HOPE'S STEEL LOK'D BAR SASH
were used in the construction
of this modern plant.

The greater strength and rigidity of Hope's Steel Windows assure ease of operation and weathertightness that will last the life of the building. In addition, their greater strength permits long, uninterrupted rows of windows; some of the openings in the building shown are more than 200 ft. long.

For full information on Hope's Steel Lok'd Bar Sash ask for Catalog 103E.R.

HOPE'S WINDOWS, INC., *Jamestown, N. Y.*

The Finest Buildings throughout the World are Fitted with Hope's Windows



OPEN-WEB JOISTS frame transversely into floorbeams and carry high-strength corrugated metal forms. Floorbeams were butt welded to column stub beam.

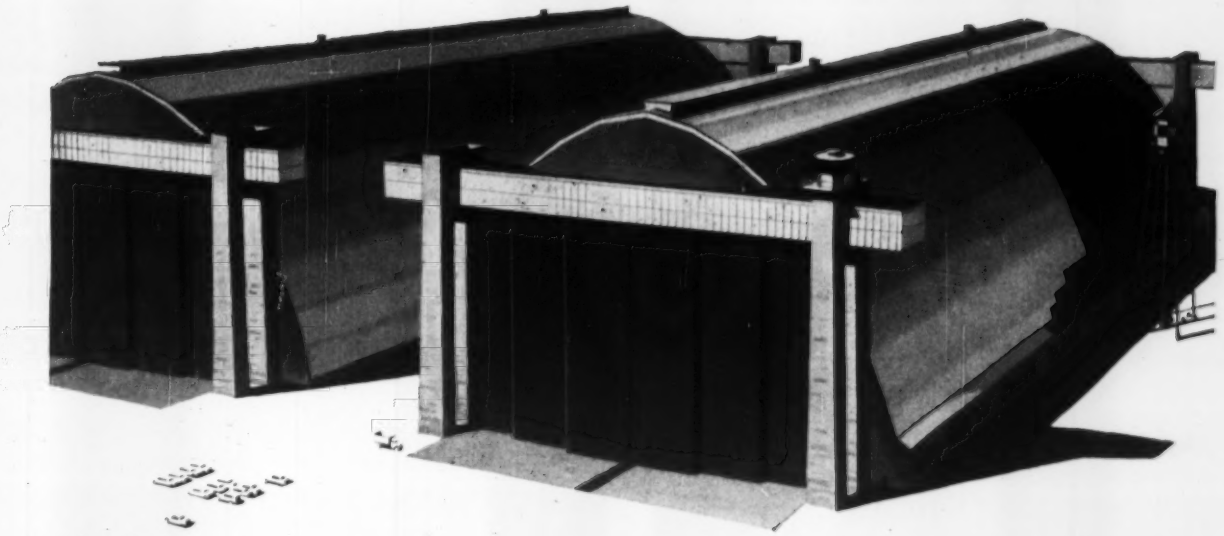
protruded to provide an erection shelf for the floorbeams. These beams, either wide-flange or builtup members, had the ends of the webs butt welded to the webs of the stubs. When the flange plates were welded on, the stubs became part of the floor beams and full continuity with the columns was established.

Open-web steel joists frame transversely into the floorbeams. Carried by this framing are high-strength corrugated metal forms that serve as both reinforcing and formwork for the cast-in-place concrete floors.

Speed and light weight governed the design. The structure is entirely welded. Corrugated forms were fastened to the open-web joists by a standard welding washer.

• **Fenced in aluminum**—For the exterior of the parking levels, instead of pipe railing a balustrade was employed. This consisted of a structural frame covered with hammered aluminum sheets. Face concrete blocks, 2½ in. thick, were used on the north wall to give increased fire protection. The remainder of the exterior combines marble tile, aluminum vertical mullions, smooth stucco and glass mosaic tile.

General contractor and designer of the building was Mutual Steel Construction, Inc. of Los Angeles, Calif. James C. Fox was structural engineer. Architect on the facade and leasing area interior was Welton Becket. Steel erectors were J. R. Cantrall Co.



22 ACRES of Alcoa® Aluminum Roofing for Lakehurst Naval Air Station

Two of the world's largest aircraft hangars shelter the Navy's blimps at Lakehurst. They cover 640,000 square feet . . . stand 175 feet high . . . have a roof area of nearly a million square feet.

Alcoa Aluminum Roofing Sheet met every requirement for this job: light weight . . . ease of application . . . ability to stay tight . . . strength to withstand the racking of the timber framing and winds up to 120 mph. The corrosion-resistant, rustproof performance of aluminum also made it desirable from the standpoint of maintaining minimum maintenance expenditures.

The sheets were made available in a special 48 inch width that saved application time and greatly reduced lapping waste. For full details on the Lakehurst Naval Air Station job as well as complete information on Alcoa industrial roofing and siding materials, contact nearest Alcoa sales office. Or write Aluminum Company of America, 860-F Alcoa Building, Pittsburgh 19, Pa.

THE ALCOA HOUR—Television's Finest Live Drama, Alternate Sunday Evenings

LAKEHURST SPECIFICATIONS

Aluminum Roofing and Siding Applicator: Elwin G. Smith & Co., Pittsburgh, Pa.

Alloy:	Alclad 3004-H16, .032 in. thick (20 B&S gage)
Sheet width:	48 inches
Corrugations:	Depth: 7/8 in. Pitch: 2.67 in.
End laps:	Steep slopes: 6 in. min. Shallow slopes: 9 in. min.
Weight:	0.96 psf including fasteners and layer of felt

ALCOA ALUMINUM BUILDING SHEET

Your Guide to the Best in Aluminum Value

Simple open wood centering supports Ceco-Meyer Flange-Type Steelforms for waffle construction used in The Center, Omaha. Here a worker is readying steelforms to fill out a panel.

Waffle concrete joist construction is an ideal solution for buildings with wide column spacings and light floor loads. Savings are made in the formwork and in the elimination of ineffective concrete.

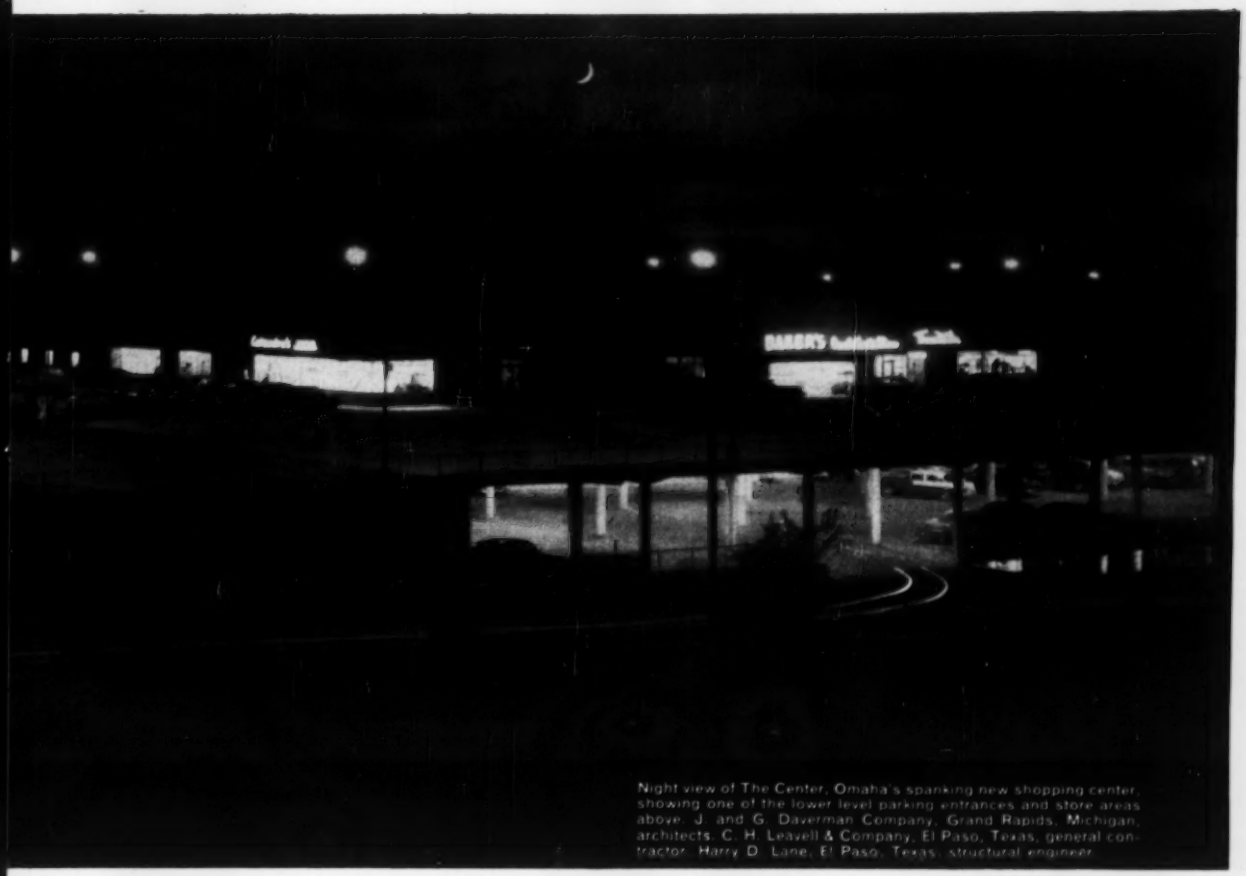
There's nothing better than reinforced concrete for permanence. With Ceco's Waffle Construction you can have permanence—plus longer spans and higher beam-free ceilings without increasing over-all building height.

Ceco Open Web Steel Joists used as roof purlins, as illustrated here, comprise the lightest of all standard roof framing, allowing long spans and light beams, columns and footings. They can be erected summer or winter—and are non-combustible and non-shrinking.

WAFFLE-TYPE PROVIDES

CECO STEEL

IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE



Night view of The Center, Omaha's spanking new shopping center, showing one of the lower level parking entrances and store areas above. J. and G. Daverman Company, Grand Rapids, Michigan, architects. C. H. Leavell & Company, El Paso, Texas, general contractor. Harry D. Lane, El Paso, Texas, structural engineer.

CONCRETE JOIST CONSTRUCTION "WIDE OPEN SPACES"... CUTS COSTS 7%

CECO ENGINEERING TAKES "LAZY" CONCRETE OUT OF LONG SPANS... Wide open spaces... that's the need in shopping centers... where the fewer the columns the more freely the merchandise moves. So in designing The Center—Omaha's newest shopping community—the architects J. and G. Daverman Company used Ceco-Meyer Steelform "Waffle" Construction to obtain long, rigid floor spans at reasonable cost. Comparison with other framing methods showed dollar savings of 7%. Non-working "lazy" concrete was eliminated by the open waffle areas—yet this two-way joist system created maximum stiffness. Further savings were made by using Ceco Open-Web Steel Joists for the roof and mezzanine. Ceco also supplied Steel Reinforcing Bars and Welded Wire Fabric, meeting exacting delivery schedules. Here's an example of how Ceco Coordinated-Engineering assures the best structure while saving money and speeding construction. Next time call Ceco for planning help.

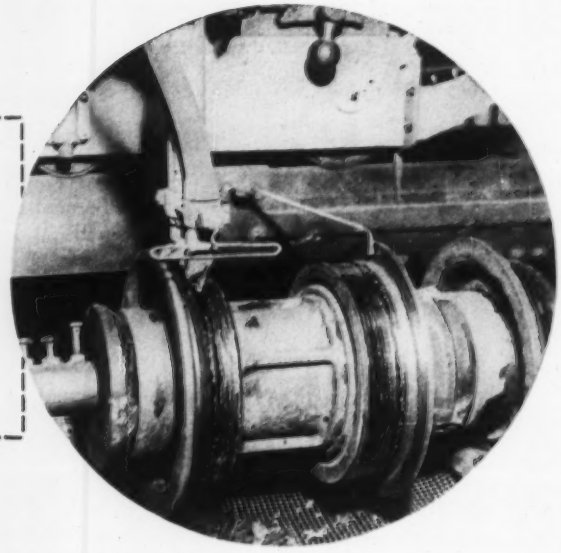
CECO STEEL PRODUCTS CORPORATION

Offices, warehouses and fabricating plants in principal cities
General Offices: 5601 West 26th Street, Chicago 50, Illinois

Windows, Screens and Doors • Ceco-Meyer Steelforms • Concrete Reinforcing • Steel Joists • Metal Roof Deck • Metal Lath

Does it pay to

REBUILD TRACTOR ROLLERS?



here's one answer...

This is a report from one of the country's largest tractor maintenance shops having complete facilities for crawler reconditioning. It particularly concerns rebuilt track rollers, a major item of wear. In this shop rollers are regularly rebuilt and hard-faced by the automatic electric welding process, using Stoody 105 on the running surface and flange.

About a year ago a tractor came into the shop for overhaul. The rollers were badly worn; those found suitable for rebuilding were returned to size with Stoody 105 and the internal assemblies thoroughly reconditioned. The balance of the rollers were discarded and replaced with standard parts. Following routine procedure, the shop foreman checked the entire crawler assembly to insure proper alignment—*a highly important factor in reducing needless wear.* After 2500 hours this tractor came in again for its customary overhaul. Inspection of the rollers disclosed the following:

The standard rollers, without exception, were worn from 3/8" to 1/2" on the running faces; in all cases the internal assemblies required several replacement parts.

Hard-faced rollers showed negligible wear on running surfaces and the only replacements needed were new seals for internal assembly.

It is of course an accepted fact that rollers rebuilt and hard-faced with Stoody 105 by the automatic method give a service life considerably beyond that of standard replacements—at a much lower cost. The hard-faced roller with its superior abrasion resistance reduces uneven wear on the track rails by providing a smooth, even working surface that allows free movement of the rails and resists grooving of the roller. Hence, wear on the internal roller assembly is also decreased

Stoody 105, the alloy used in this application, was the first automatic wire of its type and is today the alloy generally preferred by principal shops. It has been proven by eight years of actual field use—assurance of maximum service life at reasonable cost.

Earth-moving contractors operating large fleets of tractors, shovels, buckets and crushing plants often find the installation of an automatic welding head a profitable investment for rebuilding rollers, idlers, house rolls, crusher rolls and similar wearing parts. Many contractors, however, prefer to send such work to a thoroughly equipped automatic job welding shop of which there are a number located throughout the country. *A list of these job shops is available on request.*

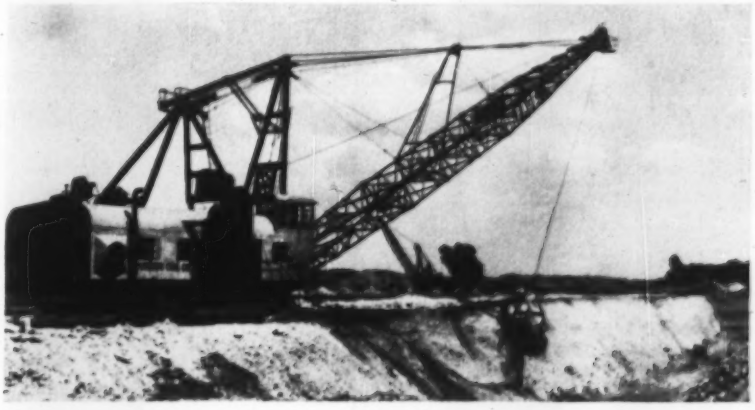
Complete information on automatic hard-facing installations and procedures will gladly be supplied—without obligation. You may consult your local Stoody dealer—see the "yellow pages" of your phone book under "Welding Equipment and Supplies"—or write direct.

STOODY COMPANY
11976 East Slauson Avenue
Whittier, California

Backhoe Made to Match Tractor

The hydraulic D4 backhoe, with ½-yd capacity, has been announced by the Hyster Co. as designed especially for the Caterpillar D4 tractor. The machine is capable of digging down to 13 ft and loading up to a height of 9 ft 7½ in. A rack and gear swing mechanism provides full swing power at uniform speed through 240 deg.

For ease in covering rough ground, the backhoe incorporates an equalizer to allow full track oscillation. The equalizer, however, may be locked to obtain rigid tractor stability. Dippers for the new backhoe are available in cutting widths of 13, 21 or 29 in. The Hyster Co., 1800 N. Adams St., Peoria 1, Ill.



New Line Single-Deck Walking Dragline

A new line of Page single-deck walking draglines, in capacities from 5 to 15 cu yd, is said to introduce new concepts in design and power.

The single deck construction is extremely compact, providing greater mobility, faster, lower cost erection and reduced shipping costs. The new line is powered by V-type horizontal diesel engines, designed and built by the manufacturer. Page Engineering Co., Clearing Post Office, Chicago 38, Ill.

New Esthetics in Acoustics With Ribs Added to Panels

For designers and architects who desire greater esthetic flexibility in acoustics, a new "ribbed" acoustic flat-plate panel has been developed.

Two rib lines, 8 in. apart, divide the 24-in.-wide panel into thirds. For acoustics, the panel is perforated and backed with an arched glass-fiber batt (ENR May 17, p. 67). Made of 18-ga steel, the "ribbed" flat plate serves as the cover for the hat-shaped, formed beam, also of 18-ga steel, which is the basic component of the maker's "D" panel. Fenestra Inc., 2286 East Grand Blvd., Detroit 11, Mich.

New Loader Design Permits High Degree of Visibility

Unimpaired operator visibility, four-wheel steering and two-axle oscillation are featured in the new Scoopmobile.

Model LD5T, a 1-cu-yd, 500-lb capacity front-end loader, transports a full load with the bucket raised off the ground just enough to clear the terrain. This gives the operator a clear line of vision at all times.

Other standard equipment on the Loader is a torque converter, planetary drive, power steering, reversing transmission and four-wheel brakes. Mixermobile Manufacturers, Inc., Portland 20, Ore.

Big Rectifier Saves Space And Cuts Down Maintenance

General Electric has developed a selenium rectifier that halves the space requirements for ac-to-dc converting equipment. Rated at 125 kw, the new model delivers five times as much power as the biggest model sold up to now, but occupies only 12.5 sq ft of floor space—less than half the room needed for its output equivalent in 25-kw rectifiers. Two desks take up more floor area than enough of the new units to supply all the direct

New Plaster "Machine Gun"

on your next job...

Build a *Fire-Safe* Plant *Faster...and at Less Cost*

Meeting the engineer's demand for high-speed plant construction, the plastering industry has developed a new plaster "machine gun" that gets the job done as much as 50% faster. And Zonolite plaster and concrete (the products applied to trusses, beams, walls, ceilings), earn the maximum in Underwriters' Laboratories fire ratings. And owners may cut fire insurance premiums thousands of dollars!

Chrysler had to complete its new $20 million dollar paint plant by model change-over time. 300,000 feet of Zonolite plaster fireproofing was blown on in a whirlwind finish. And high-performance Zonolite comes from the low-cost, lightweight mineral, vermiculite, which cannot burn! Insulates! Reduces deadweight. Send for our free manual "Systems of Lightweight Construction," which includes data on machine application of ZONOLITE fireproofing.

Engineers The "Big News" in New Plant Construction is *Machine Application of*

ZONOLITE®

FIREPROOFING PLASTER

Mail Coupon Today

Zonolite Company, Dept. EN 66
135 South LaSalle St., Chicago 3, Illinois

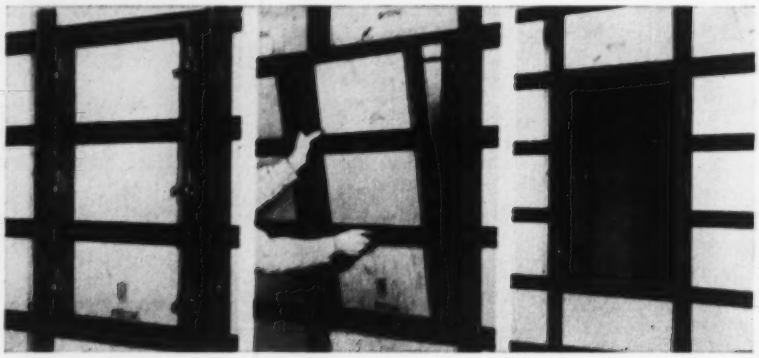
Send me free booklet G-101 "Systems of Lightweight Construction."

Name_____

Firm_____

Address_____

City_____ Zone____ State_____



Clean-Out, Pouring Pockets, Provided in New Forms

Engineers for the Universal Form Clamp Co. claim to have developed a new technique for providing clean-out and pouring pockets.

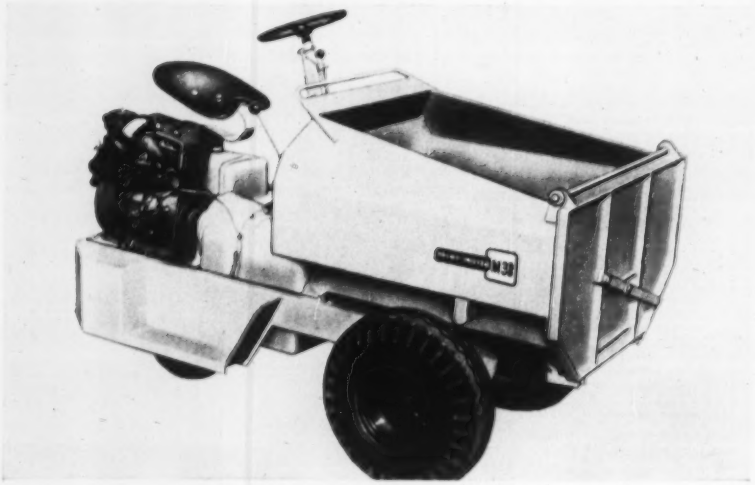
Basically, the new technique permits easy removal of panels. Standard elements of the Uni-Form System are used, to permit uninterrupted tie placement and form erection. A combination of standard panels and pouring pocket channels are used. Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.

current for an average 30-story office building.

Other advantages, GE engineers say, include less installation and maintenance and at least a 10% saving in power cost. GENERAL ELECTRIC, SCHENECTADY 5, N. Y.

Low Cost, Easy to Install Aluminum Window Frames

Simple installation, clean lines and greater economy are several of the advantages that have been claimed for a new aluminum bar window sys-



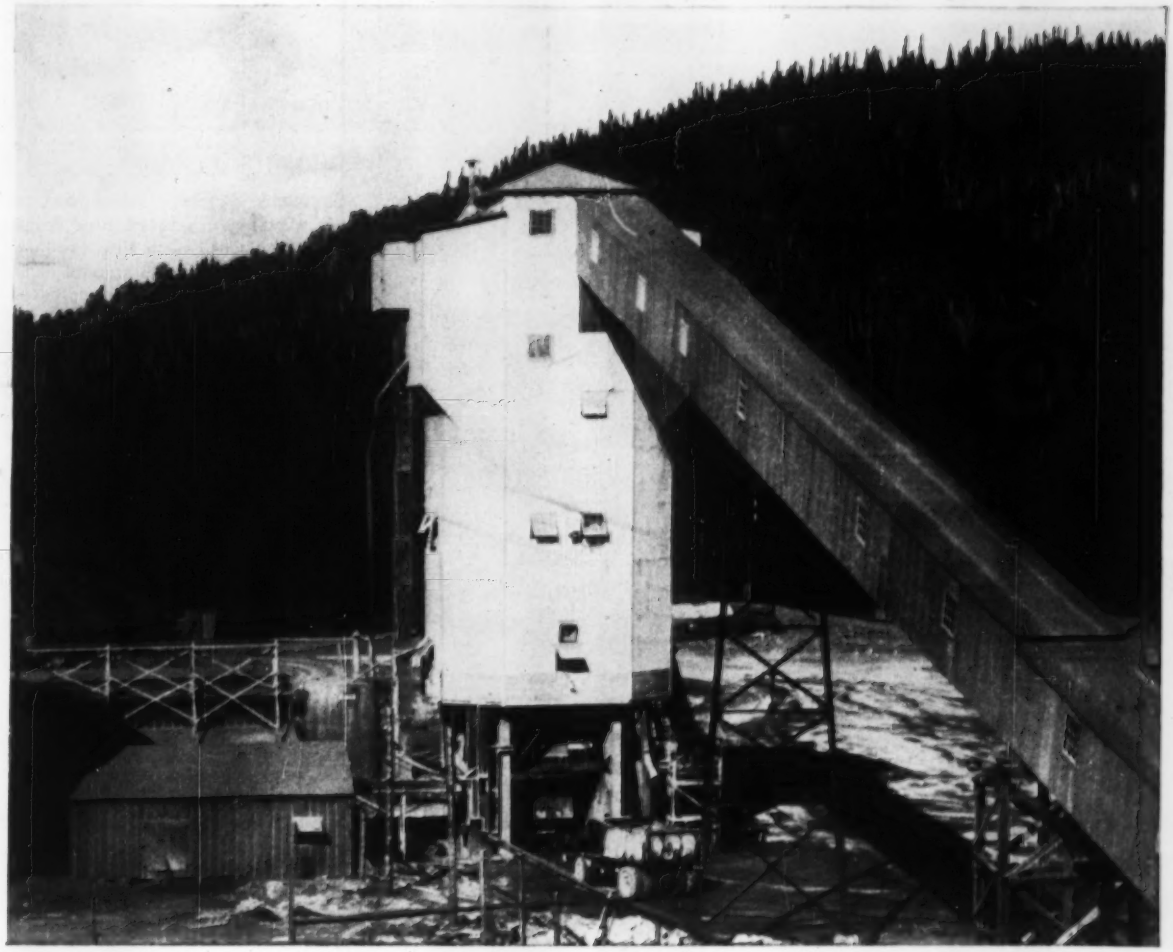
Torque Converter Drive Applied to Prime Mover

A new 18 cu ft, 1½ ton capacity construction materials handling rig, featuring torque converter drive has been introduced by the Prime-Mover Co.

According to the manufacturer, this is the first machine of its kind that incorporates a hydraulic torque converter. The machine has a top speed of 12 mph to comply with state regulations, and is powered by a Wisconsin 15-hp air-cooled engine, with electric starting. The engine is direct coupled to a transmission consisting of a three-element torque converter and directional change clutches.

The machine is engineered for speedy delivery of building materials in quantities on long-haul jobs. Standard beds available from stock include an 18 cu ft bulk handling bed and a 42-in. x 42-in. flat bed. The Prime-Mover Co., Muscatine, Iowa.

ERIE BIG BATCH MIXER PLANT SAVES MAN HOURS ON QUEBEC'S HYDRO-ELECTRIC POWER PROJECT



ONE OF the many public projects now underway in forward-looking Canada is the big Bersimis River Hydro-Electric Power Development. Located 85 miles inland from the St. Lawrence River, it will supply 1,200,000 H.P. to Quebec province.

An Erie Plant was selected to provide concrete for the job. The concrete is used to line a tunnel, 7.6 miles long and 31 feet wide, leading to an underground powerhouse. The job will require a total of 450,000 cubic yards.

The Bersimis River installation is called upon to deliver 150 cubic yards of close tolerance, varied formulae concrete per hour. It must work in temperatures ranging from 40° below zero to 88° above.

Asked about the plant, D. S. Johnson, Superintendent, Dufresne Engineering Co., Ltd., said "We selected the Erie plant because the cost was favorable, and delivery was good. We are pleased with its performance—it saves man-hours and its upkeep is reasonable."

Erie plants are available with both mechanical and electronic controls. Either is practical for both the big public development project or for the private commercial producer of specification concrete. You can count on either for efficient, profitable operation.

Here's Why:

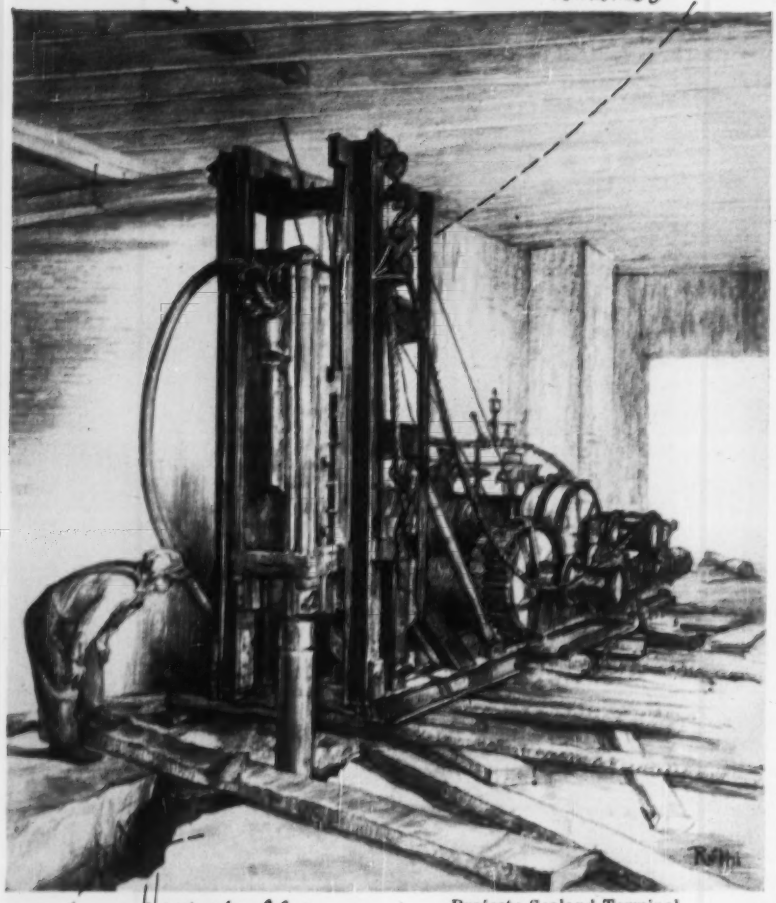
1. One-man operation—made possible by simple, accessible controls—saves man hours.
2. Greater production—its rapid charging and discharging cycle means more concrete—faster.
3. Low upkeep—ruggedly constructed, built to last. But all parts are standard—replacement is quick and easy.

For literature, write Dept. R66

ERIE STRAYER COMPANY

266 GEIST RD. ERIE, PENNSYLVANIA

ANOTHER PROBLEM SOLVED BY SPENCER, WHITE & PRENTIS



Project: Sealand Terminal, Stein-Davies Corp., Brooklyn, N. Y.

SPECIAL RIG DRIVES PILES INSIDE A BUILDING

Even though headroom was only 16 ft., this special rig made it no great problem to drive the necessary pipe piles to bedrock. (This rig has driven such piles, in sections, to depths as great as 90 ft.)

It is one of many types of special-purpose equipment which Spencer, White & Prentis has developed. Tilting feature permits easy moving of the all-steel machine, even when headroom is reduced to as little as 6½ ft.

CATALOGUE ON REQUEST

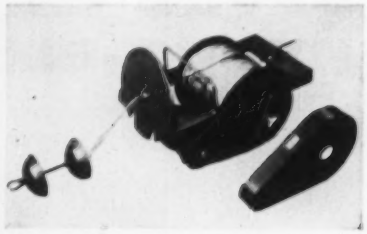
Spencer, White & Prentis

FOUNDATIONS · PILING · UNDERPINNING · SHORING · COFFERDAMS · SPECIAL SERVICES

10 EAST 40th STREET, NEW YORK 16, N. Y.

DETROIT: 2033 PARK AVE. • CHICAGO: 228 NORTH LaSALLE ST. • WASHINGTON, D. C.: TOWER BLDG.
IN CANADA: 700 BAY ST., TORONTO • 2052 ST. CATHERINE ST. WEST, MONTREAL

. . . New Products



Plumbers' Fishline

A portable pneumatic fishline that can shoot a projectile attached to a flexible steel cable through more than two-thirds of a mile of underground pipe—including 90-deg turns and bends of any angle—has been announced.

Claimed to greatly reduce the time needed to fish cable through underground conduit, the air-operated device is bolted to the pipe flange at the beginning of the run. A reeled cable is shot through the pipe to the target manhole and as soon as the manhole is reached, the propellant air is turned off and the projectile removed. T. J. Cope, Inc., Collegeville, Pa.

tem. Available in sizes up to 12 ft 6 in. high with mullion spacings of either 3 ft 6 in. or 4 ft, the 12-light window sections are recommended for very high or extremely wide openings.

Frames can be installed from either the inside or the outside of a building and are designed to allow random spacing of mounting holes in the structure for attachment of subframe. Incorporated into the frame is a glazing system with no putty exposed. No fasteners are exposed either.

Called the "Contemporary", the new frame will be manufactured in any size to meet architectural requirements. E. K. Geyser Co., 915 McArdle Roadway, Pittsburgh 5, Pa.

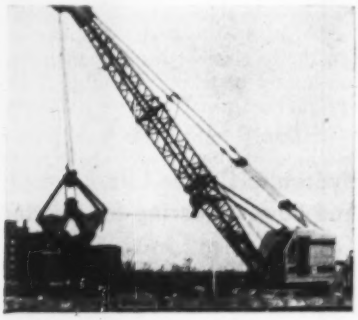
Truck-Hauled Paver Spreader Gives Big-Machine Compaction

A low-cost paving-spreading machine which the manufacturer claims gives compaction up to 80% of that of larger, self-propelled pavers with mechanical tampers, is now offered.

A patented balancing beam, compaction chamber and adjustable hinged screed are said to permit 75% of the unit's weight, plus the weight of material, to be placed on the screed. Result of bringing this weight —about 3 tons—on the screed, is a firm mat on which rolling operations can begin almost immediately. Littleford Bros., Inc., 415 E. Pearl St., Cincinnati 2, Ohio.

(New Products continued on page 68)

"Most dependable units we've ever used!"



Gar Wood 20-ton truck crane gives Frank L. Marino Corp. the right combination of heavy-duty performance and multi-job mobility. Like all "75's" it has heavy-duty, conical hook double rollers; power steering; direct manual controls; optional hydraulic coupling; easy convertibility for work with a complete line of attachments.

—says Frank Marino, Frank L. Marino Corp., Brooklyn, New York

Here's another leading contractor who depends on Gar Wood excavators to help keep jobs on schedule. A 75B with trench hoe and a 75BT truck crane with clam-shell are currently speeding work for this firm on the Linden Housing Project in Brooklyn. President Frank Marino says, "We've been using these units every day since we bought them, and they're certainly the sturdiest, most dependable units we've ever used. No down-time, repairs or service problems at all!"

Marino's operators like Gar Wood "75's" for still another reason. "Our operators say that the Gar Wood units are the easiest machines to operate they've ever worked with," reports Marino. "They especially like the clutch system." Gar Wood instant power actuated drum clutches increase production by reducing operator fatigue.

Gar Wood excavators deliver this kind of low-cost, dependable production because they're designed and built by specialists in ¾ yard machines. Find out for yourself how this specialization can pay off in more profit on your next job. Call your Gar Wood dealer, or write to: Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Findlay, Ohio

Plants in Wayne and Ypsilanti, Mich.; Findlay, Ohio; Mattoon, Ill.; Richmond, Calif.

Gar Wood-Buckeye Hi-Way Wideners

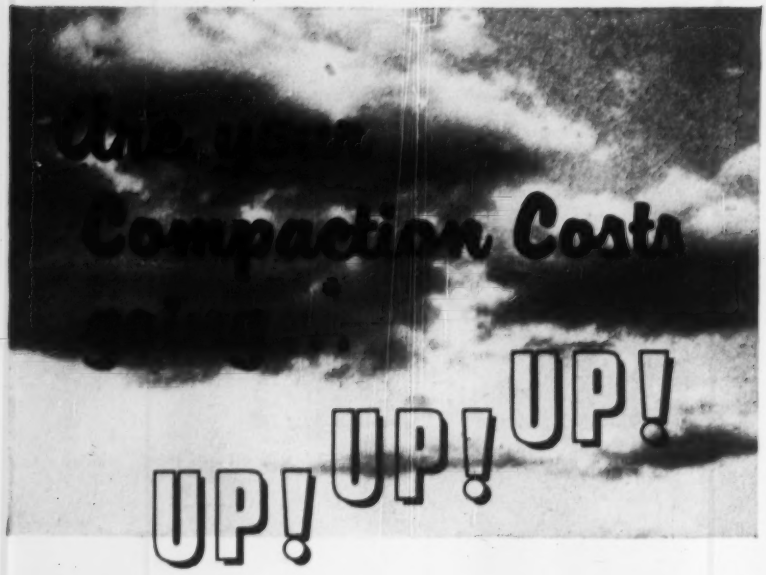
Gar Wood Tractor Equipment

Gar Wood-Buckeye Ditchers

Gar Wood-Buckeye Finegraders

Gar Wood Winches

Gar Wood-St. Paul Hoists & Bodies



. . . If you are trying to meet strict compaction specifications by adding more dead weight or making more passes with old fashioned equipment, your costs will keep mounting—but with modern TERRAPAC dynamic vibratory compaction you'll save hours of costly time on every job —do *more* work, *more* profitably!

VIBRATION—A KEY TO COMPACTION COSTS

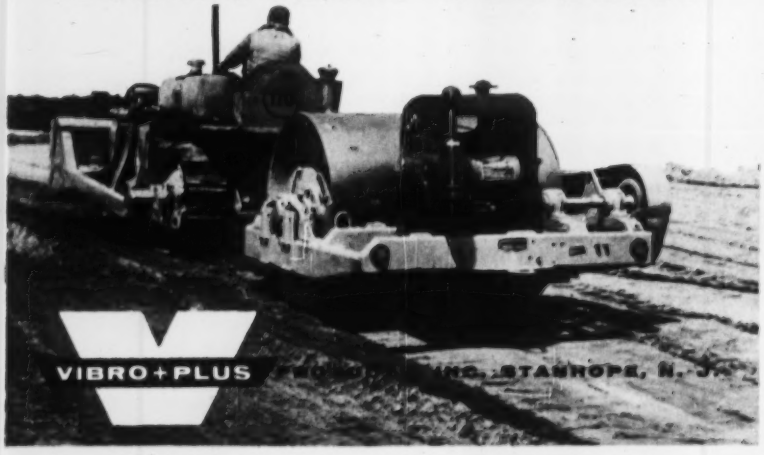
Contractors using TERRAPAC vibratory rollers can usually put in *two* or *three* times the depth of fill that would be allowed with a static roller—then compact it *faster, better* and *deeper* in *fewer passes* . . . Dynamic compaction saves TIME!

TERRAPAC ELIMINATES USELESS DEAD WEIGHT

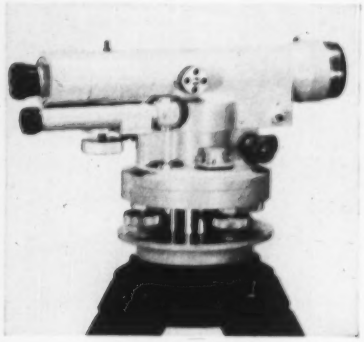
The TERRAPAC model CH30 weighs only 3½ tons yet will compact deeper, *in fewer passes,* than an ordinary 30 to 50 ton roller. Balance is so even that one man can lift either end . . . Vibration frequency can be regulated . . . Light weight permits easy handling on any type fill or soil *plus* rapid transport on any highway. Wide (58″) roller . . . Diesel power.

TERRAPAC

VIBRATORY ROLLERS



. . . New Products



New Field Level Designed For Special Operation Needs

Primarily designed to suit the requirements of engineers who found the standard 18-in. level to be inadequate for certain operations of layout work, the new "Nitac" is now available.

The problem of developing a compact instrument of 32 magnification that would be able to withstand rugged field use was resolved by the production of the double bubble instrument. The instrument, about 9 in. long and weighing 7 lb, features a coincidence type bubble visible through the same eyepiece as the object sighted upon. When ready to read the rod, the operator simply moves a micrometer screw, until the split bubble joins—this enable him to control the leveling of his instrument at the instant of taking a reading. Fennel Instrument Corp. of America, Long Island City 1, N. Y.

Hydraulic Cutter Lift Bar And Power Steering for Grader

Power steering, a hydraulically operated cutter lift bar and an improved self starter are new improvements on the Cleveland Formgrader, a machine designed to cut form trenches quickly and accurately for road construction.

The manufacturer claims that the machine now enables one man to cut form trench to exact grade, cutting as much as 6,840 lin ft in six hours. Inclusion of the power steering adds materially to ease of handling, increases accuracy and requires less attention from the operator. Cleveland Form Grader Co., Miles Rd., Avon, Ohio.

Automatic Clutch Assures Efficient Fuel Consumption

An automatic clutch is part of a group of controls that are said to assure 100% efficient fuel combustion in the "Tankar" steam heater. The efficiency of the heater is claimed to

allow production of steam within two minutes time at any gage pressure up to 200 lb, for powering steam-driven equipment.

A Mercury clutch employed in the heater applies the principle of inertia delay to allow the motor providing drive power to develop maximum torque before picking up its load. Power is transmitted to a fuel pump, water pump and blower only when the motor has reached the speed of 1200 rpm. At that speed, the fuel pump functions to force oil through the fuel spray head at pressure to atomize it instantly for immediate combustion. The clutch is manufactured by the MERCURY CLUTCH DIVISION, AUTOMATIC STEEL PRODUCTS, INC., CANTON, OHIO.

Friction Type Swing Brake Put on New Shovel Cranes

Availability of a friction-type swing brake on all shovel cranes has been announced by Link-Belt Speeder Corp., of Cedar Rapids, Iowa.

The complete Link-Belt Speeder line of crawler and rubber-tired shovel cranes, in ½- to 3-yd digging capacities and 12½- to 35-ton lifting capacities now has available the hydraulic control swing brake feature.

The manufacturer says that the brake is particularly valuable for lifting crane operations calling for precision spotting of loads, the hydraulic control permitting the operator to hold the boom in any desired position by easy control. Braking effort is hydraulically applied through power hydraulic controls and spring released. LINK-BELT SPEEDER CORP., CEDAR RAPIDS, IOWA.

GMC's Heavy-Duty Truck Line Is Improved and Expanded

An improved and expanded line of heavy-duty GMC trucks for both highway and off-the-road operations has been announced.

The 1956 line includes an expanded group of tandem-axle models, a wide range of four-wheel drive vehicles with more powerful gasoline and diesel engines, and many engineering advances. The line ranges from four-wheel gasoline models with 22,000 lb gross vehicle weight to tandem-axle vehicles with a 90,000 lb gross combination weight. Several entirely new models, including an FW550 dual-purpose, tandem-axle tractor, and a tandem-axle W670, are offered. GMC TRUCK & COACH DIVISION, 660 S. BOULEVARD, EAST, PONTIAC 11, MICH.

In concrete or steel...you can set fastening studs *in seconds* with the REMINGTON STUD DRIVER

THERE'S NO TIME LOST on a construction fastening job with the Remington Stud Driver. You can set up to 6 studs per minute with this powder actuated tool—every stud arrow-straight!

And here's more news: you can set *both ¼" and ⅜" diameter studs.* You have a choice of 40 styles and lengths of Remington Studs in both diameters—a choice of 22 or 32 caliber power loads. All it takes is 90 seconds to change barrels and you're ready for practically *every* fastening job—light, medium or heavy duty!

Once you see the Remington Stud Driver in action you'll be convinced that here is the easy, economical way to fasten door bucks, furring strip—any of dozens of fixtures—to steel or concrete. Why not ask your distributor for a demonstration? For more information, just mail the coupon below.

Remington DUPONT

Industrial Sales Division, Dept. ENR-6
Remington Arms Co., Inc., Bridgeport 2, Conn.

Please send me your free booklet which shows where and how to use the cost-saving Remington Stud Driver fastening method.

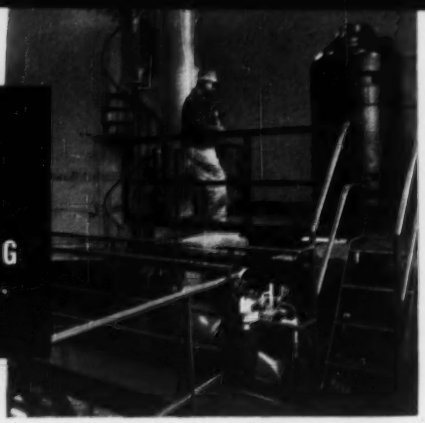
*Name*_____ *Position*_____

*Firm*_____

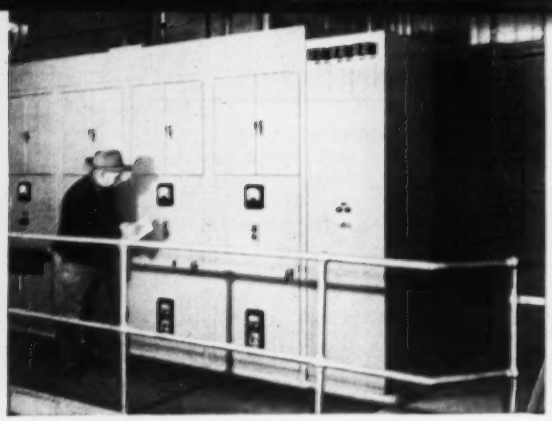
*Address*_____

*City*_____ *State*_____

ENGINEERING REPORTS:



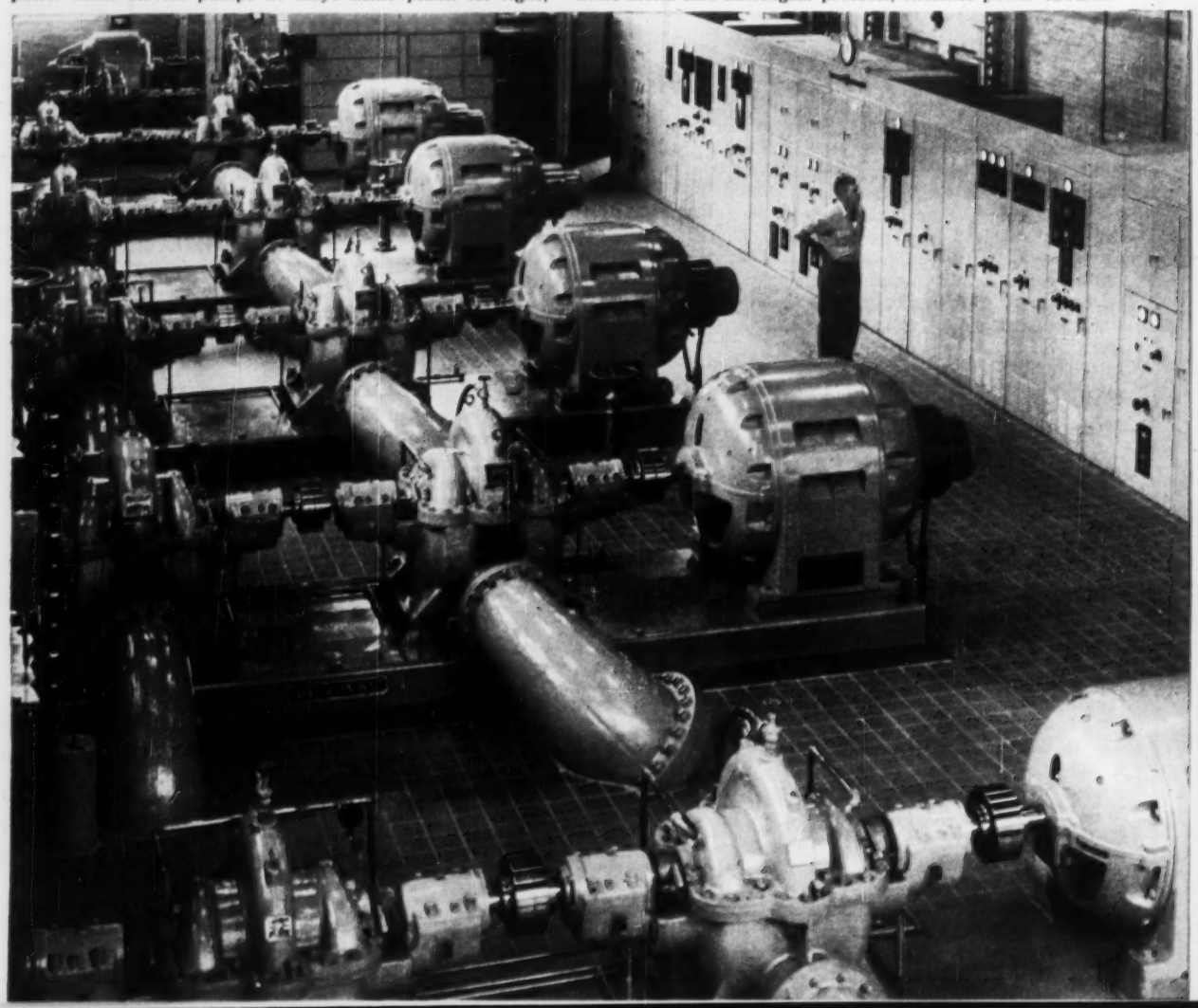
CHATTANOOGA WATER CO.—One of G-E pump drives at Citico Station is sturdy 400-hp Tri-Clad* vertical pump motor. Easy-to-get-at bearings simplify motor maintenance.



JOPLIN WATER WORKS CO.—Shoal Creek Station uses highly-reliable Limitamp* control for high-voltage motors. Units are custom engineered from standard design to meet application needs of customer.

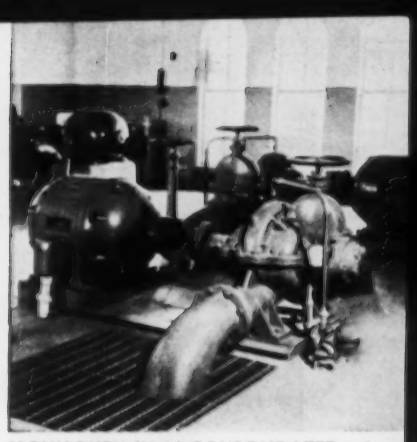
General Electric helps AWWS design, equip

SO. PITTSBURGH WATER CO.—G-E synchronous motors power main service pumps at Hays Mine plant. At right, Limitamp control provides co-ordinated control of motors while metal-clad switchgear protects, switches power circuits.



LEXINGTON (KY.) WATER CO.—Tri-Clad 500-hp synchronous motor dependably powers key pump. Tri-Clad design protects against physical damage, electrical breakdown, operating wear.

E. ST. LOUIS & INTERURBAN WATER CO.—Tri-Clad motor and factory-engineered control typify General Electric co-ordinated drive system.



MONMOUTH (N.J.) CONSOLIDATED WATER CO.—Sturdy Tri-Clad induction motors also serve main pumps here. Units require little maintenance.

far-flung waterworks to cut operating costs

25 years of successful service to American Water Works Service Co. demonstrate high quality of General Electric engineering, equipment

The American Water Works Service Co., Philadelphia, is responsible for system design and equipment selection for its scores of privately-owned affiliated water companies serving cities throughout the country. It helps assure efficient, low-cost operation at these plants through use of up-to-date equipment and engineering practices.

FOR 25 YEARS General Electric has been privileged to supply equipment and engineering assistance for many of these installations. G-E application engineers have worked closely with AWWS engineers to help select and co-ordinate modern apparatus to cut cost and help assure reliability of operation. G-E field service engineers have helped speed installation of these systems, cutting start-up time to a minimum.

This long record of satisfactory co-operation with AWWS, engineering unit of the country's largest group of private waterworks, gives strong testimony to the value and quality of G-E systems and services.

WHATEVER YOUR ELECTRIFICATION PROBLEM, G-E engineering services can help you save time and cost with system-engineered G-E equipment. Contact your nearest G-E Apparatus Sales Office early in your planning. General Electric Co., Schenectady 5, N. Y. 664-41

Engineered Electrical Systems for Waterworks

GENERAL ELECTRIC

AWWS AND G-E ENGINEERS work out a typical waterworks power distribution problem. From left, Guy Waldrop, Chief Mechanical Engineer, AWWS; A. S. Doxsey, project engineer, AWWS; T. L. Harris, G. F. Fischer and F. M. Jones, General Electric engineers; and D. F. Bixler, project engineer, AWWS.

*Registered Trade-mark of General Electric Company

THE TROUBLE WITH TROUBLE...

you can't scare it away!

SOME PEOPLE in distant lands rely upon masks and rites to scare away misfortune.

But American businessmen know from experience that the best protection for their interests overseas is strong, reliable insurance through the American Foreign Insurance Association.

That's because AFIA's experts are skilled in fitting fire, marine, casualty and surety insurance to the needs of business—and to the conditions prevailing where the foreign risk is located.

This knowledge of sound underwriting with world-wide service through more than 600 foreign offices makes AFIA an outstanding choice of America's business leaders.

Ask your Insurance Agent or Broker to consult AFIA on your foreign insurance problems.

COURTESY AMERICAN MUSEUM OF NATURAL HISTORY

AFIA

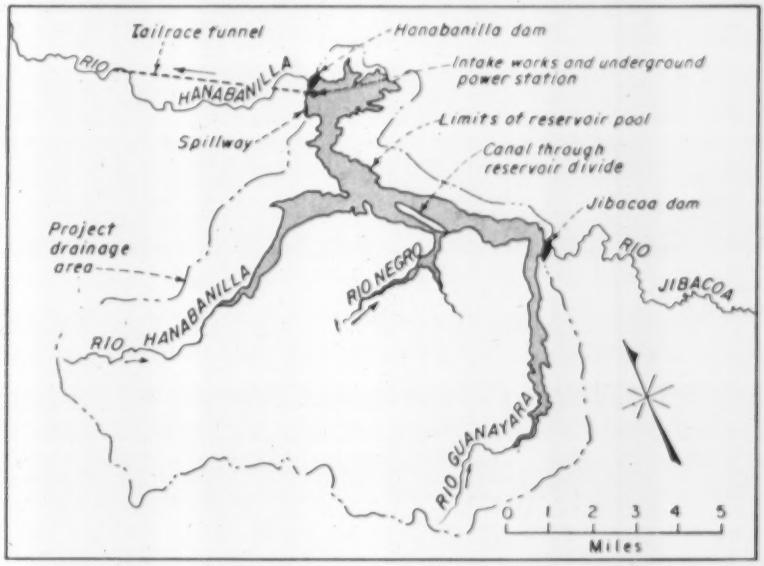
AMERICAN FOREIGN INSURANCE ASSOCIATION

161 William Street • New York 38, New York

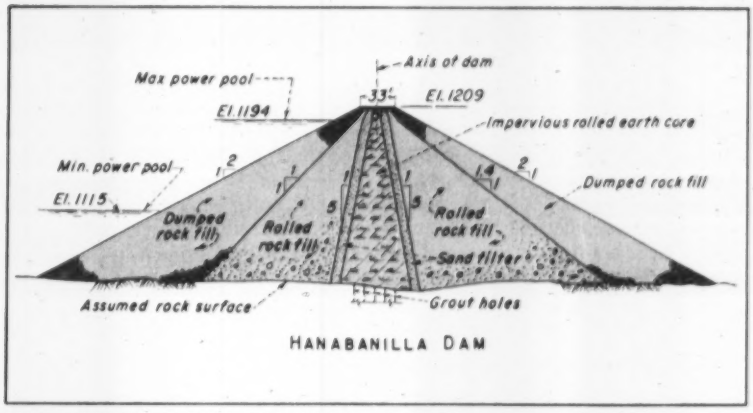
CHICAGO OFFICE . Insurance Exchange Building, 175 West Jackson Blvd., Chicago 4, Illinois
DALLAS OFFICE . . . . . Mercantile Bank Building, 106 So. Ervay Street, Dallas 1, Texas
LOS ANGELES OFFICE . . . . . 3277 Wilshire Boulevard, Los Angeles 5, California
SAN FRANCISCO OFFICE . Russ Building, 235 Montgomery Street, San Francisco 4, California
WASHINGTON OFFICE . . Woodward Building, 733 15th Street, N.W., Washington 5, D.C.

A Big Small Job:

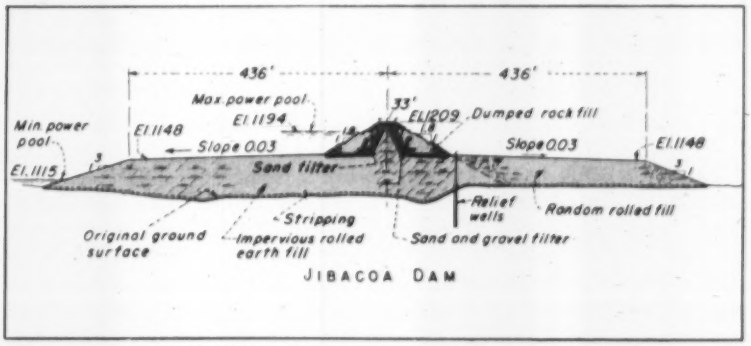
Big engineering—diverting two rivers, two rock- and earth-fill dams, 870-ft head, underground powerhouse, 4½-mi tailrace tunnel—for a fairly small job goes into . . .



Hanabanilla: Cuba's Hydro Project



HANABANILLA DAM is 154 ft high and 850 ft in length along its crest. Rock from spillway excavation forms inner rockfill zones.



DIVERSION DAM—Broad-based Jibacoa Dam will back up Negro and Guanayara river water in to the Hanabanilla watershed.

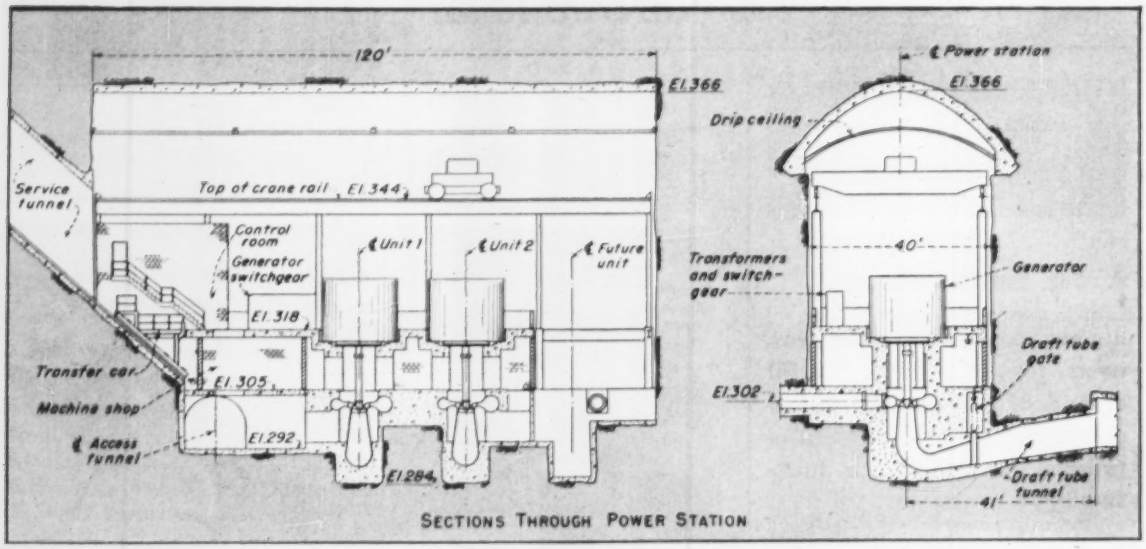
Hanabanilla Project—Cuba's first hydro of any magnitude—packs a lot of engineering into a fairly small job.

The 45,000-kw installation—large in relation to Cuba's quarter-million-kilowatt total installed capacity—entails an underground power station, diversion of two rivers, two rock- and earth-fill dams, an 870-ft head, Francis turbines (despite the high head), and a 4½-mi tailrace tunnel.

The job will be accomplished by four contracts for construction and twelve contracts for purchase of equipment, all of which are being bid with world-wide competition.

First major construction contract—$4.9 million worth of underground excavation work—was awarded in January to The Tecon Corp., Dallas. The contract for construction of dams for $3.2 million was awarded in March to Ingeniería G. delValle S.A. of Havana. Contracts for construction of power facilities and the transmission line will be bid later. Excavation work now is getting started on the site, 150 mi southeast of Havana.

In New York, consultants Tippetts-Abbett-McCarthy-Stratton have completed the involved and interesting job of evaluating bids for eight power equipment contracts that came from ten separate countries. A $300,000 contract for supplying the two 15,000-kw generators of the initial installation has been signed with AEG



SECTIONS THROUGH POWER STATION

of Germany and final negotiations are under way for awarding the remainder of the generating and control equipment contracts to U. S. and Italian firms.

• **Switch to hydro**—Demand for more power—plus the high, $300-per-kw, cost of diesel-electric plants in Cuba—brought Banco de Fomento Agricola e Industrial de Cuba to investigate the island nation's hydroelectric possibilities. There resulted the establishment of a government agency known as PRICHEC (Primera Central Hidroelectrica Cubana)—for development of Cuba's first hydro. And Tippetts-Abbett-McCarthy-Stratton, as its consultant, recommended the site presently under development, 25 mi into the mountains from Cienfuegos on the island's southern shore.

The $15-million project that developed has many of the elements of a very much larger project, but all scaled down and tucked into two narrow valleys of the rugged Trinidad-San Juan Mountains. From elevations as high as 3,600 ft in these mountains which get a little less than 75 in. of rainfall mostly between June and November, flow the Hanabanilla, Negro and Guanayara rivers, and all three have been worked into Cuba's first hydro scheme.

• **Diversion of flow**—Between the Hanabanilla and the Negro rivers is an almost imperceptible divide, formed of alluvial material. By damming both rivers and cutting a trapazoidal, unlined canal through to join them, the project's builders will form a 2,500-acre reservoir. The dam across the Negro will be just downstream of its junction with the Guanayra River, where the two form the Jibacoa. It is called Jibacoa Dam.

Jibacoa Dam, the diversion dam that will back up Negro and Guanayra river water into the Hanabanilla watershed, will be topped by a small rockfill dam with a rolled earth core that will spread out as an impervious berm, extending far upstream and down. Two factors determined the design of this broad-based section: Soil below is weak, and it is only semi-impervious, needing the blanket effect (see drawing). Jibacoa Dam will be about 130 ft high and will need no spillway; all overflow from the reservoir will spill from its Hanabanilla end.

Hanabanilla Dam, will have a rolled, impervious core under which a grout curtain will seal the generally sound diorite gneiss rock. The core will be bounded on each side by two rock zones. The inner zones will be rather novel rolled rockfill sections, using weathered rock materials obtained largely from excavation of the spillway. The outer zones will be conventional dumped rockfill sections, not requiring slope protection. From bedrock, the dam's height will measure 154 ft. Its length at crest will be 850 ft.

Off to the left of Hanabanilla Dam a 370-ft wide, saddle-type uncontrolled overflow spillway will be created by cutting the rock down and inserting a concrete sill. Also near the main dam, two relatively small dams will be needed to fill two low saddles.

Between the dam and the spillway, the powerhouse intake structure will top with gates and trash racks a vertical penstock shaft 800 ft deep, with a concrete enclosed steel liner 8.5 ft in dia, feeding water to the underground powerhouse directly below.

• **Choice of plant type**—Two power schemes were considered—a "tail" development with a long pressure conduit extending from the reservoir to an above-ground power station, and a "head" development with an underground power station discharging into a long free-flow tunnel. Adoption of the latter arrangement will result in a saving of an estimated $3 million in first cost.

The 4¼-mi tailrace tunnel is to be a 14-ft horseshoe section, unlined except where lining is required by poor rock conditions—free-flowing, designed to flow eight-tenths full, except under severe flood conditions when high tailwater will drown the tunnel and result in up to 30 ft of head. Average discharge through the plant's turbines will be 165 cfs initially. This amount may be adjusted as operating experience is gained.

River diversion during construction will be through a 6.5 conduit cast in reinforced concrete in a cut at the base of the right abutment. A flow of up to 15.5 cfs must be passed through the Hanabanilla dam during certain periods in the dry season to maintain a minimum flow downstream for water supply. Cienfuegos (1953 pop., 100,000) depends on the Hanabanilla River for its supply, and the planned tailrace tunnel will bypass

This 2,680′ Bridge River, British Columbia, penstock was built by B. C. Electric. Of 75⅝″ O. D. steel pipe, it is Dresser-Coupled in 40′ lengths with maximum slope of 39½°. Uncovered except for one intermediate tunnel, it tested completely leakproof at 1000 psi.

6 ft. 3 and TROUBLE-FREE at 1000 psi

B. C. Electric installs 4th Dresser-Coupled penstock

Convinced of the advantages of Dresser Couplings, the B. C. Electric Company, since 1948, has installed four 100 per cent Dresser-Coupled penstocks at Bridge River, British Columbia. On all four projects, the use of Dresser Couplings resulted in faster completion of the line and assured permanently tight, maintenance-free joints. This meant earlier revenue from plant operation . . . uninterrupted service to power consumers.

Throughout the world, leading engineers and contractors recognize the superiority of the Dresser pipe joining method — permanent tightness, flexibility, simplicity, strength and economy.

Even highest pressure penstocks are faster and easier to install when Dresser Couplings are used. The need for special skills and expensive equipment is minimized. In many cases, a field crew of a few men can cut construction time from months to weeks through the use of Dresser Couplings. Work proceeds in any weather with wrenches the only tools needed.

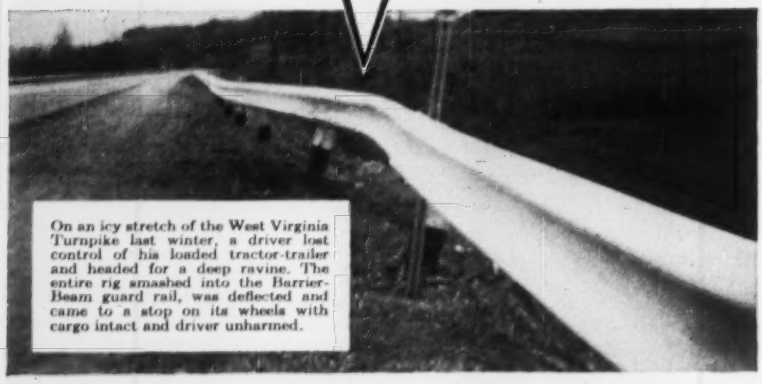
Where required, high tensile steel permits thinner pipe walls and lower pipe weights. This means easier handling. In some cases, up to 25 per cent in weight is saved.

But a Dresser-Coupled penstock's most important advantage is permanence . . . it stays bottle-tight for life. The resilient gaskets built into every coupling assure positive sealing, eliminate expansion-contraction problems, permit joint deflections so the penstock may follow the natural contour of the right of way.

For your next penstock project, send for helpful, interesting engineering data on the successful and varied Dresser-Coupled steel penstock installations. Write Dresser Manufacturing Division, Bradford, Pa.

ONE OF THE DRESSER INDUSTRIES

Saved... a LIFE, a cargo and a complete rig!

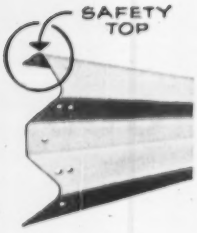


On an icy stretch of the West Virginia Turnpike last winter, a driver lost control of his loaded tractor-trailer and headed for a deep ravine. The entire rig smashed into the Barrier-Beam guard rail, was deflected and came to a stop on its wheels with cargo intact and driver unharmed.

Specify USF BEAM-TYPE GUARD RAIL

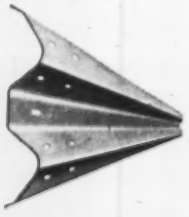
BARRIER-BEAM

A rugged deep beam section with the famous rounded Safety-Top, noted for high impact strength, good deflection, maximum protection and ease of installation and maintenance.



UNIVERSAL-BEAM

A standardized interchangeable deep beam rail having turned-back edges and featuring easy erection, strength, and simplification of purchasing, stocks, and maintenance.



Write for Literature

USF UNITED STEEL FABRICATORS, INC.
WOOSTER, OHIO
USS STEEL
PRODUCTS | Hollow Metal Doors • Prefabricated Metal Buildings • Window Wells
Highway Guard Rail • Bridge Flooring • Corrugated Metal Pipe
Sectional Plate Pipe and Pipe Arches

the existing aqueduct intake. An 18-in. pipe placed in the diversion conduit after construction of the dam is expected to supply the demand.

The underground powerhouse is to measure 40 x 120 ft in plan and be 75 ft high. It will be reached by a 16-ft inclined access tunnel about 1,100 ft long. An inclined railway—capable of carrying passengers as well as the largest generator part—will be installed in this service tunnel. The upper end of the service tunnel will be topped by an access house. Transformers will be placed above ground adjacent to the switchyard, and will be connected to the generators by cables through the service tunnel.

The PRICHEC Board is headed by Emeterio S. Santovenia, President, with Eugenio Castillo as General Manager.

L. A. Lovell, associate partner, directs the work for Tippetts-Abbett-McCarthy-Stratton with P. S. O'Shaughnessy as resident manager in Cuba and A. S. Goodman as project engineer in New York.

India May Build New Canal To Stimulate Coastal Trade

India is looking over plans for a new $20-million canal that would link the southern Gulf of Mannar with the Palk Straits and give coastal trade an unbroken seaway of more than 3,000 miles.

The gulf and the straits run between India and Ceylon. Separating them is a narrow gap that now is partially bridged to carry the railway within a few miles of the Ceylon coast.

The new canal would be 5,400 yd long, 32 ft deep, 150 ft wide, and feature five approach canals, a lock and a bridge. It would start from the gulf port of Tuticorin, which would be developed as part of the project, and run in a straight line through a sandy area to the straits.

One of the difficulties to be overcome is the effect of two monsoons on the volume of water in the gulf and the straits. During the northeast monsoon, strait waters are at a higher level than those in the gulf. The reverse is the case during the southwest monsoon. Therefore, the lock would have to regulate and equalize the flow as well as prevent strong currents from eroding the canal's banks.

Also under consideration is a proposal to deepen the Palk Straits so it can be used by ocean-going vessels. At present, ships touching western Indian ports enroute to the Bay of Bengal have to go all the way around Ceylon.

NEW International® Payhaulers

for years a leader in the manufacture of heavy-duty construction equipment, International now offers you the same fine engineering and rugged dependability in

OFF-HIGHWAY HAULERS

MODEL **95** 24 TONS

TWO **ALL NEW** MODELS

MODEL **65** 18 TONS

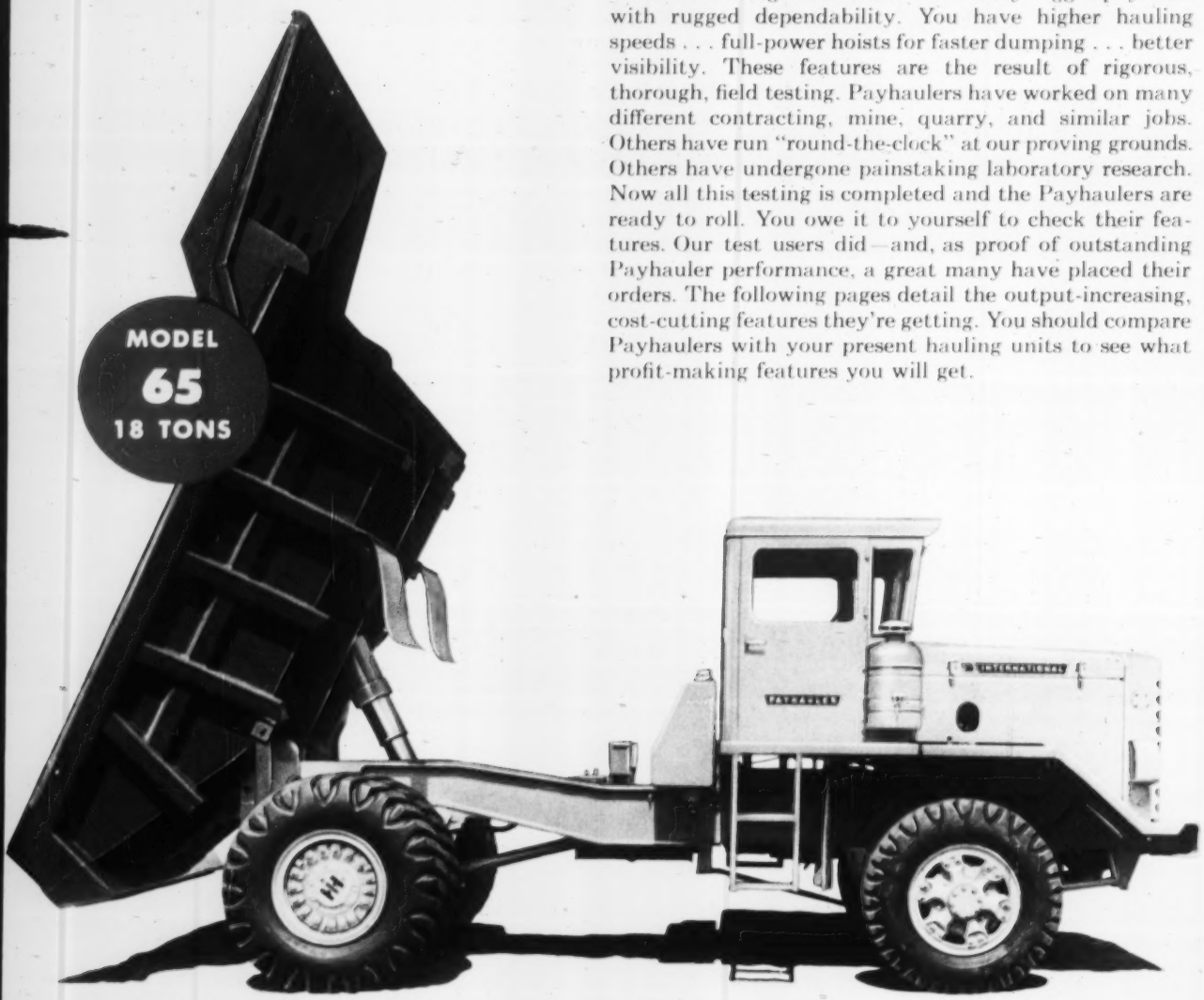
NEW HORSEPOWER • POWER • COMFORT • ECONOMY

Announcing the NEW

Designed with features you asked for

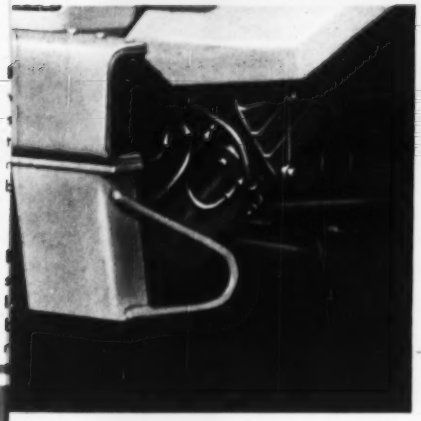
250-335 HP Turbo-Charged Diesel Engines
Rugged, Welded, All-Steel Frame
Full-Floating Axles Planetary Drive
Speeds to 38 MPH
Power Shift Transmission

Hundreds of contractors, mine owners, quarry operators, and other equipment users told our engineers what they needed in an off-highway hauler. Their suggested design features have been carefully built into the new International Payhaulers. In these rugged, all-new, rear-dump haulers, you have greater horsepower-to-payload weight ratios than are available in most other off-highway trucks. You have stronger main frames to carry bigger payloads with rugged dependability. You have higher hauling speeds . . . full-power hoists for faster dumping . . . better visibility. These features are the result of rigorous, thorough, field testing. Payhaulers have worked on many different contracting, mine, quarry, and similar jobs. Others have run "round-the-clock" at our proving grounds. Others have undergone painstaking laboratory research. Now all this testing is completed and the Payhaulers are ready to roll. You owe it to yourself to check their features. Our test users did—and, as proof of outstanding Payhauler performance, a great many have placed their orders. The following pages detail the output-increasing, cost-cutting features they're getting. You should compare Payhaulers with your present hauling units to see what profit-making features you will get.

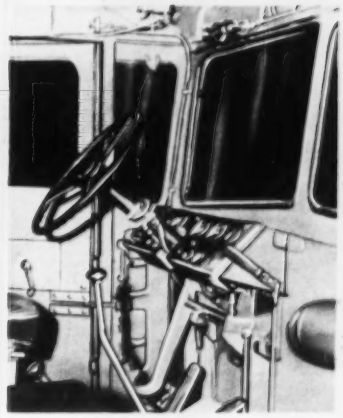


Designed for operator comfort easier operation

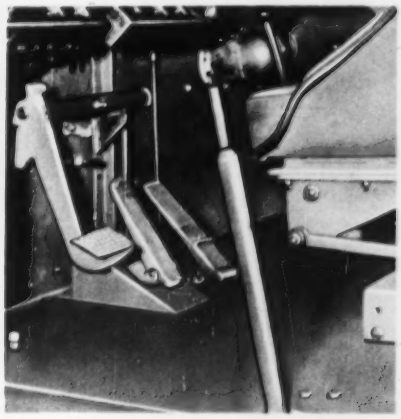
Driver looks through giant windshield, has picture window vision ahead and to both sides. When backing into close quarters, he need only open door and look around; offset cab gives unobstructed view to rear. Vents at top, bottom, and rear of cab provide a cool "office" for the operator.



Power Steering. No broken thumbs in the new International Payhaulers! Hydraulic boost gives operator power-steering control on haul roads—effortless steering when spotting under shovels.



The Driver "Takes It Easy" in the comfort-designed Payhaulers. He sits in a leather-covered, bucket-type, fully-adjustable seat. Jars and jolts are cushioned through compression spring, hydraulic shock absorber. He handles center-grouped, easy-to-reach controls. Clean floor with suspended brake pedal, handy hoist lever location make the operator's job even easier.



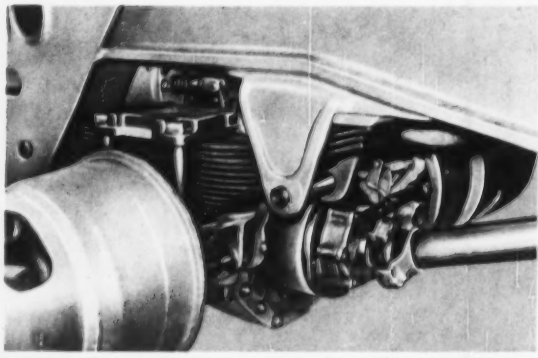
Accessible Service Checks. Outside mounting speeds air cleaner servicing. Inspection port in hood permits ready access to oil dip stick and filler pipe. Lightweight aluminum side sheets are easily removed for engine inspection.

Full Day's Fuel Supply. There's no need to slow down a Payhauler job for refueling. These big haulers pack 125 gallons, enough fuel for a full day's operation on most jobs. Filter-type breather caps and built-in strainers help keep fuel clean and grit-free.

International® Pay

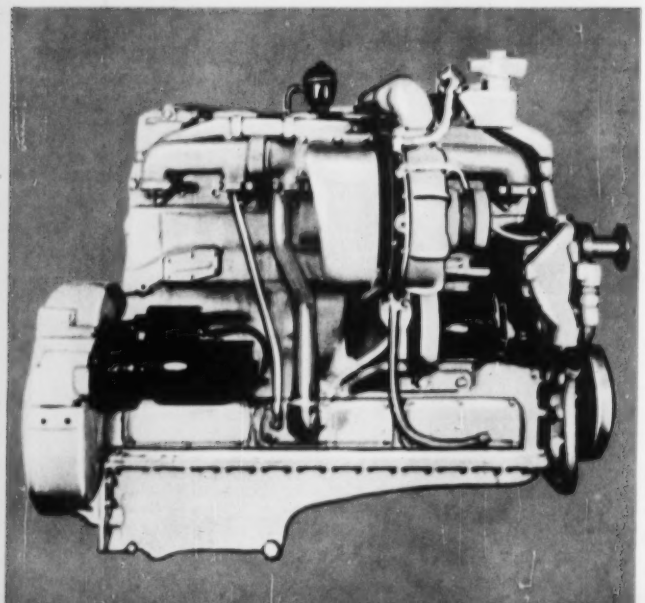
Rock-rugged

Rugged Frame. Built of heavy-duty welded and conventional "I" beams with web thicknesses of ½ and ¼ inches, Payhauler main frames have the strongest section modulus known of any off-highway truck. Rear-frame section of rolled "I" beams is held rigid by tubular torque and hoist mounting members. Front frame sections flex with shock loads through channel bumper torque member.



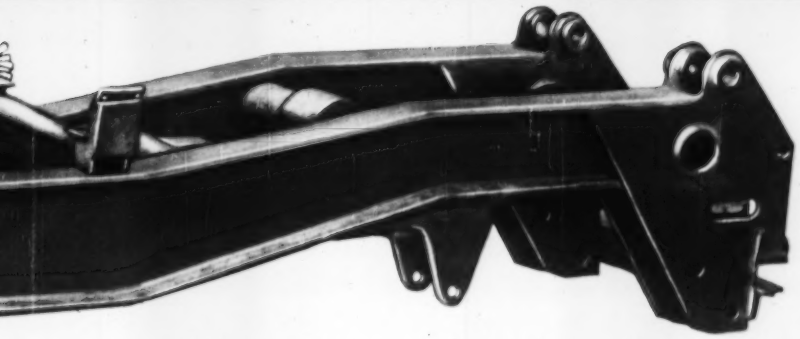
Free-Floating Springs. *From the ground up, Payhaulers pack extra strength for outstanding performance on rugged jobs.* Semi-elliptic, multiple leaf, free-floating springs effectively "swallow" the shocks of loading from big shovels and of high-speed hauling over rough ground. Heavy-duty, radius rods keep springs and axles in position.

Pay-off powered

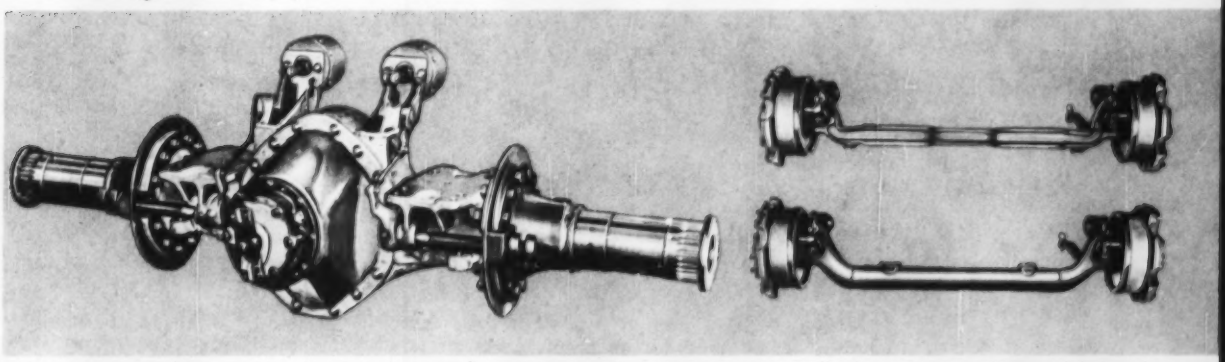


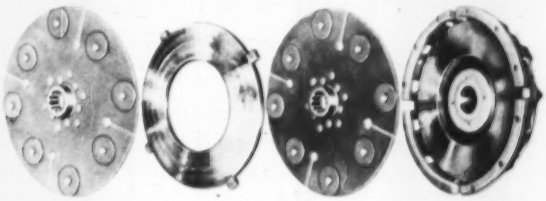
Both the "65" and "95" Payhaulers have more horsepower per struck yard than any other truck in their size class. The 24-ton, 16-yard "95" is powered by a 335 hp diesel . . . the 18-ton, 12-yard "65" is powered by 250 hp engine. Turbo-charging keeps power high, weight low, reduces fuel consumption 10% or more. Large radiator (below) with 1425 sq. in. of area plus powerful 32-inch fan insure proper engine cooling under all job conditions. Suspended on four large rubber mounting pads, the Payhauler radiator is protected against shock.

yhaulers



Sturdy Axles. Durable axles help Payhaulers carry 36,000 to 48,000 lbs. smoothly, comfortably at speeds up to 38 mph. Note the massive differential housing with in-built spring mounting pads. Heavy-duty, rear axle housings bolt to the differential to provide top load carrying capacity. Front axles are equally sturdy—of forged or tubular design.



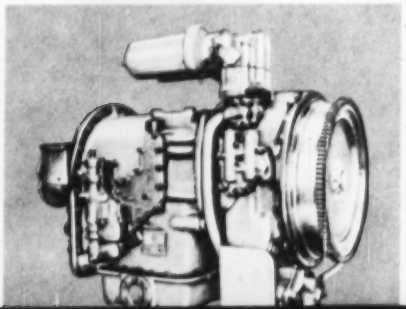


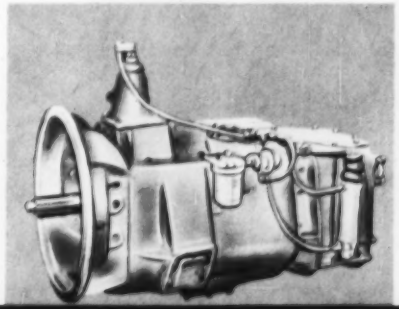
Cerametallic Clutch. In gear-drive models, cerametallic clutch facings virtually eliminate over-heating. This clutch, made of heat-defying material, needs fewer adjustments, gives longer life, smoother action than any other clutch in the off-highway truck field.

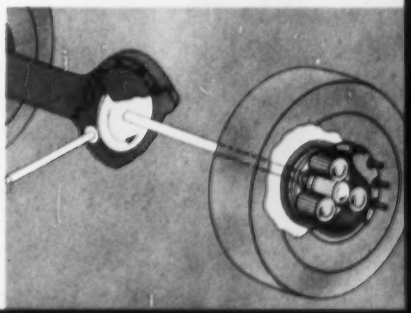
Torque Converter. The 24-ton Model 95 Payhauler is available with a 4-speed Torque Converter transmission for smooth speed changes from 4.8 to 38 mph. A lock-up clutch for direct drive performance and a Torqmatic brake system are standard with the versatile Torqmatic transmission. No other truck provides these features as standard equipment.

Conventional Transmission. You have a choice in the "65" Payhauler of a 5 or 10-speed geared transmission to fit job conditions—speed ranges are from 3.5 mph to 36.5 mph for either. In the "95" Payhauler, a 9-speed transmission provides an excellent range of speeds from 2.6 to 37.2 mph. Operators especially like the single lever air-assisted shift control.

Planetary Final Drive. Both Payhaulers translate engine power into big load handling capacity through a rugged differential to planetary drive wheels. Sun gear is integral with full-floating axles for greater strength and simplified maintenance.







4 RUGGED BODIES meet all hauling needs

Payhauler bodies are all welded, reinforced steel designed with oak fill to cushion shock loads. Inside floor and side sheets are durable Manten steel. For the Models "65" and "95", you can get a rugged quarry body—for the Model 95, two standard bodies (heated or unheated) are available to fit any job condition or material.

BRIEF SPECIFICATIONS	Model 65	Model 95
Capacity	18 tons	24 tons
Engine hp	250	335
Transmission	10-speed gear 5-speed gear	9-speed gear Torque Converter
Steering	Hydraulic	Hydraulic
Weight—Gross with Payload	76,160 lbs.	96,220 T.C.

Specifications Subject to Change Without Notice

INTERNATIONAL HARVESTER

INTERNATIONAL® Construction Equipment

INTERNATIONAL HARVESTER COMPANY, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines.

California Fills A Prize Engineering Post

Appointment of Harvey O. Banks, now state engineer, to direct California's ambitious water development program (ENR June 7, p. 27), is far more significant than a mere move from one post to another within the state's official family.

Early this year Gov. Goodwin J. Knight had announced that he would search the country over to find the best possible man to head the state's new Department of Water Resources, which becomes a legal entity July 5. Many candidates were considered before Banks was chosen.

To strengthen the state team, the governor is bringing in an outsider—Mercel J. Shelton—to serve as Banks' deputy. Shelton is presently general manager and chief engineer of the La Mesa, Lemon Grove and Spring Valley Irrigation District—a large and important water utility in the San Diego area. In that position and other activities, Shelton has become a leader among California engineers.

In announcing the appointments, Gov. Knight put the full weight of his office behind early construction by state forces of large water development projects. Some authorities have recently said that California's water problems are now more legal and financial than they are engineering. The governor blasted this line of thinking by declaring that he wanted experienced construction men to head his new department because the state plans to undertake water project building.

As Director of the Department of Water Resources, Banks will have full authority and responsibility for the various water programs. Banks will be a member of the Governor's Council (comparable to the President's Cabinet in the federal government). This is in contrast to his old job as State Engineer—a position to be abolished—where he served as engineer for various policy making boards. The California Water Plan (ENR May 17, p. 27), for example, was prepared for the State Water Resources Board. Under the new setup this board is continued in existence (several others, however, are abolished) but in an advisory capacity to Banks. The legislature, in establishing the new department, asks that the "director and the board be in agreement wherever possible." But the act continues, "in the event of disagreement . . . the views of the director shall prevail." Thus all technical decisions will in the final analysis be made by Banks. His decisions must not only be technically correct, they must also be salable to the legislature and to the people of California. Reason is that financial support for the Feather River Project and the California Water Plan must come from the legislature and the electorate.

MERCEL J. SHELTON—His appointment as deputy director also won the applause of California engineers.

• His background—What kind of a person is this man that will direct the largest nonfederal water resource development in history? His experience shows him to be a student, educator, soldier, consulting engineer and civil servant. Born in New York 46 years ago, Banks graduated magna cum laude from Syracuse University in 1930 with a degree in civil engineering. His first work in California was as an instructor at Stanford University where he also did graduate work in hydraulic and sanitary engineering. Other early positions were with the U.S. Soil Conservation Service, the New York Department of Public Works and the City of Palo Alto, Calif.

Banks first joined the Division of Water Resources in 1938 where he worked on groundwater resources investigations and groundwater rights adjudications. During World War II he served in the Army's Corps of Engineers for 3½ years with 27 months of this time in overseas service. He left the Army as a Major and now holds a Corps of Engineers reserve commission as a Lt. Colonel.

HARVEY O. BANKS—He'll direct the biggest nonfederal water resource development in history.

In 1946 Banks left state service to enter private practice as a partner in the firm of Harold Conkling, consulting engineer, in Los Angeles. One project of this firm was a comprehensive plan for development of water resources of California's Ventura County.

Banks returned to the Division of Water Resources in 1950. After holding various positions, he became state engineer and Chief of the Division of Water Resources last November on the retirement of A. D. Edmonston. This job is a civil service position whereas the new director's position is not. With his civil service rating Banks would have been assured of one of the top spots in the new department. Instead he is taking the $18,000 a year appointive spot. Here he is subject to confirmation by the State Senate. And, he can be removed from office for any reason by the Governor. He can also be fired by the legislature—both Houses—for dereliction of duty, corruption or incompetency.

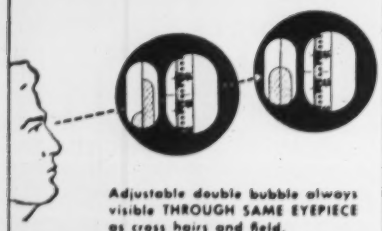
Banks has been active in activities

SURVEYORS!

Save time

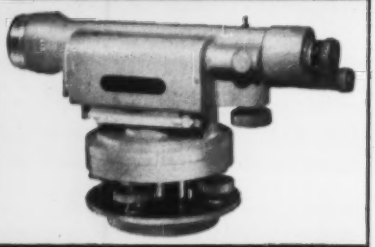
Save money

NEW LEVEL with



Adjustable double bubble always visible THROUGH SAME EYEPIECE as cross hairs and field.

DOUBLE BUBBLE



is "MISTAKE FREE"

- No need to turn telescope during leveling
- American type—erecting eyepiece, 4 leveling screws
- Unbelievably fast and accurate, yet simple-to-use. Economical!

Mail this coupon for details

FENNEL

INSTRUMENT CORP. OF AMERICA
45-22 Pearson St., Long Island City, N. Y.

Please send me Booklet J with information on Fennel...

☐ Double bubble ☐ Alidades
☐ Other levels ☐ Collimators
☐ Transits ☐ Stands
☐ Combinations ☐ Tripods
☐ Theodolites ☐ Repair of present instruments, (any make)

NAME.....

ADDRESS.....

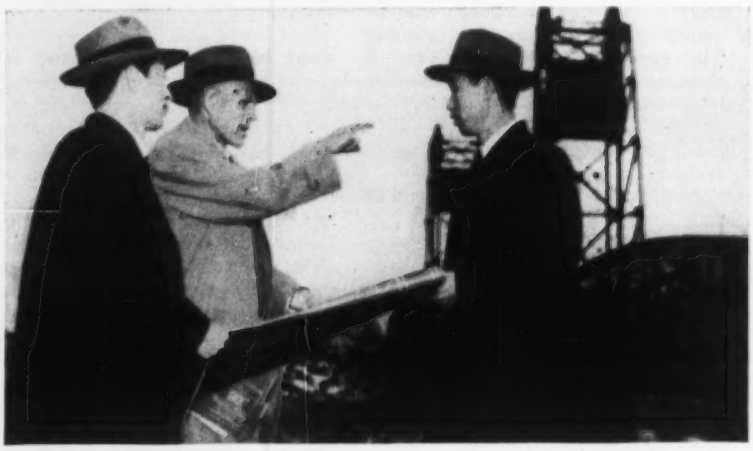
.....

of the American Society of Civil Engineers, serving recently as chairman of an important technical committee of the Irrigation Division (Committee on Utilization and Development of Ground Water Storage for Irrigation). And he recently served as a member of an ASCE task committee on engineering education. As a result of this latter assignment he presented a paper on engineering education before a national ASCE meeting in February 1955 that may give an insight into the way he will handle his new job. According to Banks, in addition to emphasis on the scientific approach, efforts must be made to "instruct in those aspects of engineering which are not susceptible of rigorous analysis." He continued, "we must not forget that civil engineering, particularly is still very much an art and must be taught accordingly." Banks said, "The larger and more complex the problem or situation in civil engineering, generally the less susceptible it is to systematized analysis, and the more the engineer must depend on intuitive concepts and analysis, and on judgment, rather than on methodology; witness a large multipurpose water development project."

In his paper on engineering education, Banks said that the engineer must acquire the basic knowledge necessary to "understand, deal with, manage, and direct people." Banks continued, "This is an area in which civil engineers as a group are notably lacking." He urged more emphasis on public speaking and report writing.

• **The water plan**—Although finishing touches have been put on the California Water Plan under Harvey Banks as state engineer, it can in no way be considered his plan. The plan has been in the development process for nearly 10 years under two other state engineers, A. D. Edmonston and Edward Hyatt. And, officially, the Division of Water Resources has merely been serving as engineer for the State Water Resources Board.

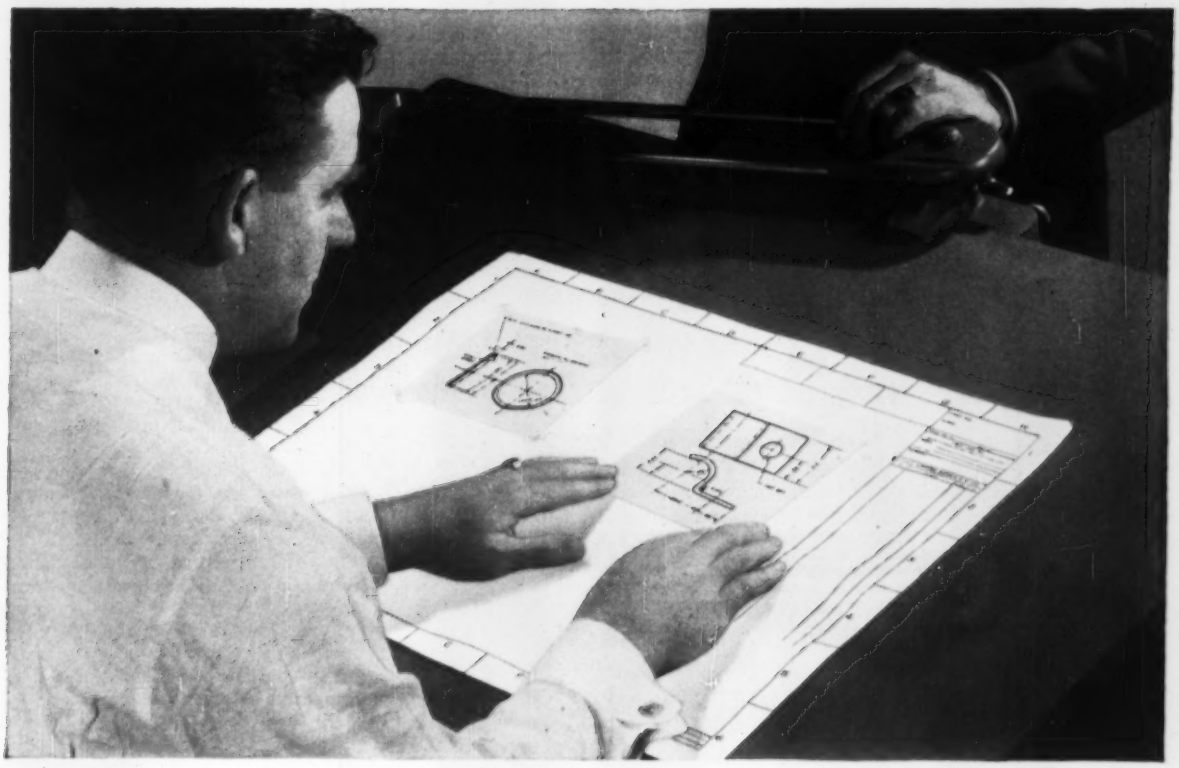
Actually, the $11.3-billion plan has yet to be finalized. It has merely been released for review. And as a long-range master plan, it may never become final. In a February 1956 speech before a California Chamber of Commerce group, Banks said that water resources planning must be a continuing and progressive process. Banks is just as much interested in present accomplishments as future planning. In the speech just cited he said, "The providing of water plans for our children and grandchildren is a laudable pursuit. . . . However, what California needs today is more developed



Visitors From Korea

Tong Whee Kim (right) and Hyo Seung Lee, Korean civil engineers are in the U.S. for training in harbor and channel dredging as part of the International Cooperation Administration training program. Kim is Director of Dredging Operations for the Republic of Korea. Lee is in charge of harbor construction projects in Kunsan harbor.

Lee and Kim visited the Summit Bridge on the Chesapeake and Delaware Canal which is operated by the Philadelphia District of the Army Engineers. This low-level span will soon be replaced by a high-level span as part of program by the Army Engineers for improving the canal. C. B. Brown, resident engineer at Chesapeake City, Maryland, sub-office of the Corps, explains the operation of the bridge to the visitors.



To save hours of redrafting when repeating designs

By using low-cost photo-templates of your standard designs—made on Kodak Autopositive Film Thin Base—you can combine or build up drawings as easily as this:

1. Position the Autopositive Film templates on a drawing form, using transparent tape
2. Order an Autopositive Paper intermediate of the paste-up
3. On this print, add the connecting lines or new design . . . and a new print-making master is ready.

Ready in a fraction of the redrafting time; *at a fraction of the cost, too!*

This is only one of the short cuts possible with Kodagraph Reproduction Materials, which you, or your local blueprinter, can process quickly at low cost. Positive photographic copies are made *directly*. No darkroom or special equipment needed. Get all the facts.

EASTMAN KODAK COMPANY
Graphic Reproduction Division, Rochester 4, N. Y.

New booklet is jam-packed with valuable tips on saving drafting time, protecting drawings, getting better prints.

Kodagraph Reproduction Materials

MAIL COUPON FOR FREE BOOKLET

EASTMAN KODAK COMPANY 67
Graphic Reproduction Division, Rochester 4, N. Y.
Gentlemen: Please send me a free copy of your new booklet on Kodagraph Reproduction Materials.

Name_____ Position_____
Company_____
Street_____
City_____ Zone_____ State_____

Kodak TRADE MARK

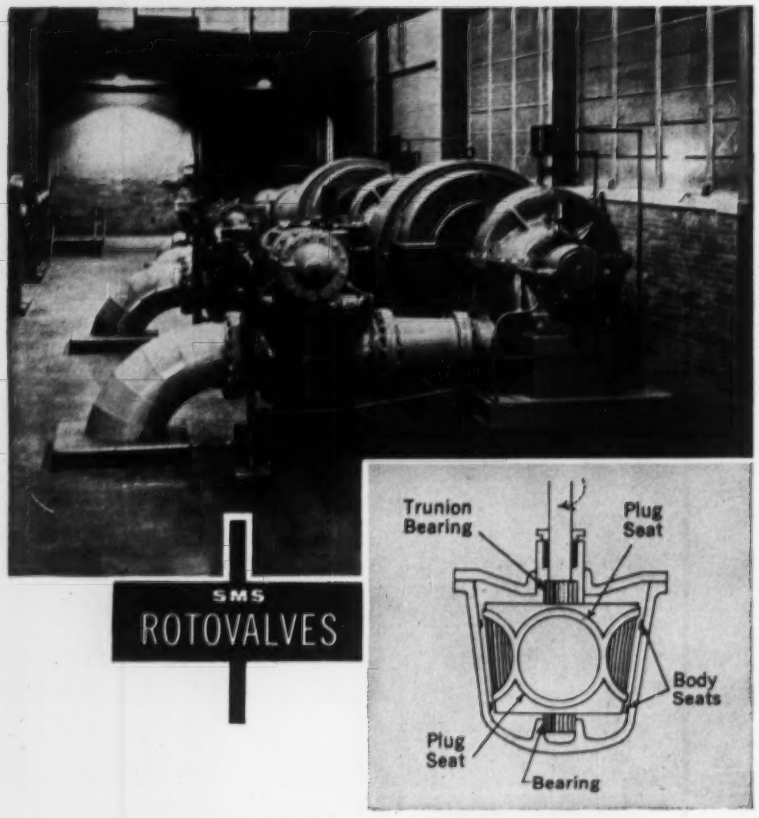
water for our immediate needs." In this regard Banks has been champion for early construction of the Feather River Project as the first step in implementing the California Water Plan. He has predicted that with adequate funds, the first stage of construction can be initiated a year hence. And he predicated that before the end of 1962, Oroville Dam will be at half-height to provide a considerable degree of flood protection. Since those predictions were made, the legislature has voted design funds. So now it remains for Banks to convince them and/or the voters that construction funds are needed.

Banks is convinced that there is enough water in California, including the Colorado River rights, to serve all foreseeable purposes within the state. He admits water problems and water deficiencies in nearly all areas of the state. But he believes these problems are the result of maldistribution of the state's natural water supplies, both as to place and time of occurence, as related to needs.

Banks gives much credit to water resource development in the past by local enterprise and the federal government. But he believes "neither the combined efforts of local enterprise nor the assistance of the federal government have completely solved our problem nor have we kept up with our rapidly increasing water needs." Banks feels there are too many other calls on federal money for water development in California to be entirely a federal project. And he believes the massive interregional transfers of water called for are too large a job for local interests. Thus he concludes, "The state must take over a major share of the responsibility for development of its own water resources."

• **Deputy director**—Appointment of M. J. Shelton as deputy director is also applauded by California engineers. Since graduation from Purdue in 1930, Shelton has had considerable engineering experience. This includes private practice and service as city engineer for El Centro during the reconstruction of the city following the 1940 earthquake. As did Banks, Shelton served with the Corps of Engineers during World War II. After that his entire experience has been with the La Mesa, Lemon Grove and Spring Valley Irrigation District becoming general manager and chief engineer in 1948.

Shelton has been active in association work. He served as president of the San Diego Section and as national



SMS-ROTOVALVE DESIGN ASSURES POSITIVE CLOSING, LONG LIFE

For fast, easy operation and positive closing, specify SMS-Rotovalves. As shown above, the conical plug, with full line opening, first lifts, then turns, finally reseats. Bronze trunnions eliminate friction and wear to seats, the causes of failure and breakage. Self-purging monel to monel seating assures drop-tight closure.

Rotovalves are designed to solve your control problems. You can be sure of easy operation, precise aperture control, controlled closing time, positive closure, easy mechanical cleaning, low maintenance and long service life. The Rotovalve's full line opening means less head loss and lower pumping costs.

Performance characteristics like these are the result of more than 75 years of hydraulic research and engineering. To get full information on the complete line of Rotovalves, Ball Valves and Butterfly Valves, contact our local representative or write S. Morgan Smith Co., York, Pa.

HYDRAULIC TURBINES · GATES & HOISTS · TRASH RAKES · PUMPS · ACCESSORIES
HYDRODYNAMICS
ROTOVALVES · FREE-DISCHARGE VALVES · BALL VALVES · CONTROLLABLE-PITCH SHIP PROPELLERS · BUTTERFLY VALVES

S. MORGAN SMITH

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED • TORONTO

Installing 36-in. tar-enameled steel pipe in a wooded area northwest of Worcester.

20,000-ft steel main installed in Worcester

One of the biggest water-supply projects to be completed in New England in 1955 was the Worcester, Mass., high-pressure line. The design working pressures are 160 psi for the 36-in. ID section and 190 psi for the 30-in. ID section.

The steel main extends somewhat over 20,000 ft from the pumping station at Holden Reservoir No. 2 to a point near Indian Lake, where it connects with Indian Hill Reservoir. Its high capacity and great reserve strength make the line an important source of water for the present and future needs of industrial Worcester.

Photographed on the job are (left to right) Fred Dodge, inspector for Metcalf & Eddy, Boston, design engineers for the project; Cliff Johnson, president of Johnson Brothers, general contractor; Joseph Flatley, inspector for Metcalf & Eddy; C. B. Hardy, Water Superintendent for the City of Worcester; Ernest Johnson, partner in Johnson Brothers.

The line is 36 in. ID for some 14,300 ft from the pumping station to Grove Street, where it is reduced to 30 in. ID. Bethlehem supplied the pipe in easy-to-install 40-ft lengths, coated and lined with coal-tar enamel, and protected with felt and paper wrappings. Every length was hydrostatically tested in our shop in accordance with AWWA specifications. Field joints were made with Dresser couplings.

If you have a new large-diameter line in mind, we urge you to consider the many advantages of welded steel pipe. No other material can match steel pipe for strength, long life, resistance to damage, leak-proof joints and ease of installation. May we give you more information? Please contact the Bethlehem sales office nearest you.

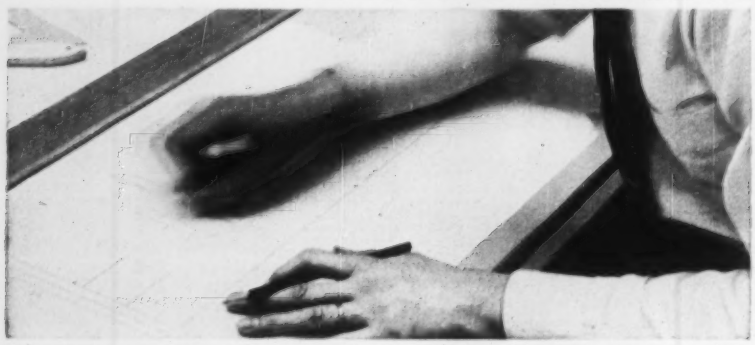
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

DRAFTING TRENDS

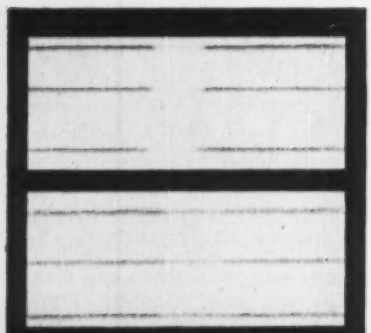


Controlled tests have proved the remarkable erasing qualities of new Blutex tracing vellum.

Improved tracing vellum erases cleaner and faster

A newly improved vellum called *Blutex* has unusual erasing qualities and eliminates "ghosting" on tracings and prints. Manufactured by Post, the product is a revised formulation of an established vellum.

Chief reason for the cleaner erasing qualities is a new combination of transparentizing materials used in treating the base stock. (The base stock itself is exceptionally hard.) Unlike many other vellums, *Blutex* is



Unretouched photos of pencil lines and erasures on Blutex (top) and another leading vellum after identical aging of both sheets.

treated with 100% synthetic resins rather than oils. The carefully selected resins provide a "drier" working surface; dry yet never brittle. This unusual dryness, combined with an extra hard surface, permits faster, cleaner erasures.

The new process also affects the *future* erasability. The materials are specifically formulated to resist heat and aging. The transparentizing agents will not *fuse* with the graphite lines, a common condition in other vellums that make erasures difficult. Laboratory tests have shown that *Blutex* is just as erasable after 100 trips through a printer as it is when first used.

Another Blutex advantage is its fine *drawing* quality. The dry surface and excellent tooth take dense, opaque lines with ease and uniformity.

In addition to these improvements, new *Blutex* is actually more transparent. The new formulation is carefully controlled to preserve the stock while actually increasing the transparency.

Testing samples and information on Blutex is available from the Reader Service Division of the Frederick Post Company, 3668 N. Avondale Avenue, Chicago 18.

POST

SENSITIZED PAPERS & CLOTHS • TRACING & DRAWING MEDIUMS • DRAWING INSTRUMENTS & SLIDE RULES
ENGINEERING EQUIPMENT & DRAFTING SUPPLIES • FIELD EQUIPMENT & DRAFTING FURNITURE

director of ASCE. He is currently vice chairman of the California Section of the American Water Works Association. He is director and secretary of the San Diego County Water Authority, the agency that receives and distributes Colorado River water from the San Diego Aqueduct. He has served as chairman of the San Diego Regional Water Pollution Control Board. Banks, in his capacity as state engineer, also serves on that board.

Shelton's job as deputy director is an executive officer to Banks. It is a non-civil service job with service at the pleasure of the governor.

Col. P. O. Stuart Assigned As Corps District Engineer

The Corps of Engineers has named Col. Parker O. Stuart as District Engineer of Charleston, S. C. He will succeed Col. Clyde C. Zeigler, who has been given an overseas assignment.

Colonel Stuart, recently returned from duty in Korea, is now attending the Armed Forces Staff College in Norfolk, Va., and will report to his new station in mid-July.

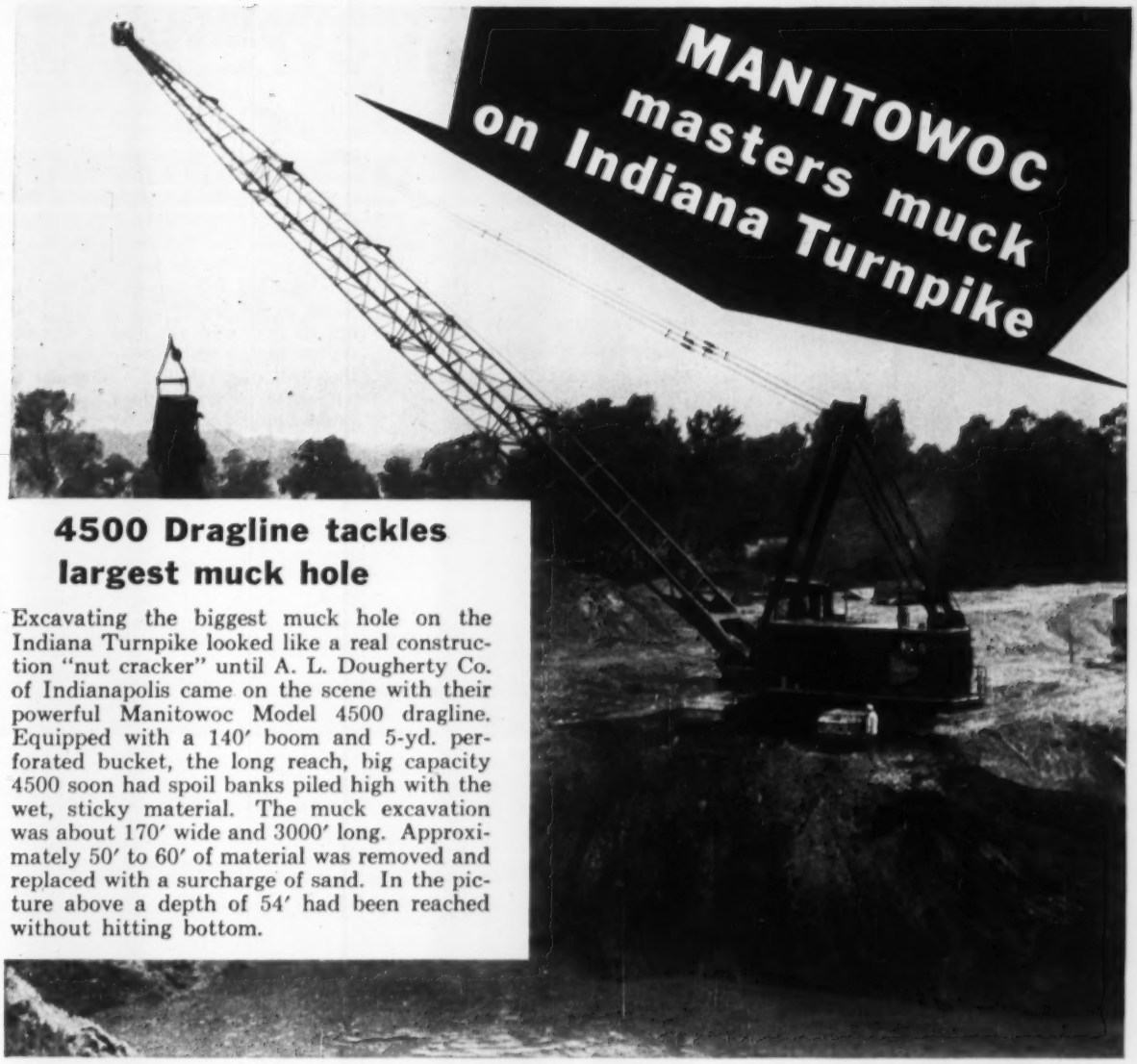
Colonel Stuart was commissioned in the Corps in 1940, after graduating from University of Maine with a degree in civil engineering. During World War II he served in Europe as commanding officer of the 817 Engineer Aviation Battalion. Later, he was stationed at Army Air Force headquarters in Washington, D. C., and then at Sault Ste. Marie, Mich., as construction engineer. From 1951 to 1954 he was in the Office of the Chief of Engineers as assistant chief of the Maintenance Division, Military Supply.

Chief Named for Sanitary Engineering Section, MSC

Lt. Col. Floyd L. Berry has been appointed chief, Sanitary Engineering Section, Medical Service Corps.

He will be responsible to the Chief of the Medical Service Corps in all administrative matters and policy recommendations concerning training, appointments, promotions, separation and procurement of sanitary engineering officers, and will advise the Army Surgeon General on professional activities relating to sanitary engineering.

Colonel Berry received his undergraduate training at Georgia Institute of Technology and at the University of North Carolina. He received his Master of Science degree in sanitary engineering at John Hopkins University in 1947.



MANITOWOC masters muck on Indiana Turnpike

4500 Dragline tackles largest muck hole

Excavating the biggest muck hole on the Indiana Turnpike looked like a real construction "nut cracker" until A. L. Dougherty Co. of Indianapolis came on the scene with their powerful Manitowoc Model 4500 dragline. Equipped with a 140′ boom and 5-yd. perforated bucket, the long reach, big capacity 4500 soon had spoil banks piled high with the wet, sticky material. The muck excavation was about 170′ wide and 3000′ long. Approximately 50′ to 60′ of material was removed and replaced with a surcharge of sand. In the picture above a depth of 54′ had been reached without hitting bottom.

You need outstanding Dragline performance for tough jobs like this

• **POSITIVE STABILITY** assures full capacity buckets with any length boom. You get more heaped loads from one position, cutting down on the number of machine moves. Long, wide crawlers with low ground pressure let you work in soft, hard-to-reach spots and travel over soft ground without mats.

• **MORE POWER** through simple, clean design. There's less dead weight — less maintenance . . . more power for top performance every shift. Fewer parts provide more effective utilization of power. Fuel consumption is lowered for most economical operation possible with a machine of this size. Single diesel power plant eliminates need for several electric motors and thousands of electric wires and connections . . . greater mobility without dangerous, awkward cables dragging from machine.

• **FAST CONVERTIBILITY** to shovel and crane operation makes the 4500 a versatile unit for any type of construction job. Big capacity, 5½-yd. shovel is engineered for your roughest jobs. 100 ton crane is ideal for heavy construction work. Manitowoc Engineering Corp., Manitowoc, Wis.

Your MANITOWOC distributor has all the facts on the Powerful 4500 . . . contact him now!

MANITOWOC

SHOVELS 1-5½ YD. Speed Crane CRANES 20-100 TON

A grain elevator gets a good going over, *INSIDE, OUTSIDE!*

COMPLETE BREAK-THROUGH IN WALL

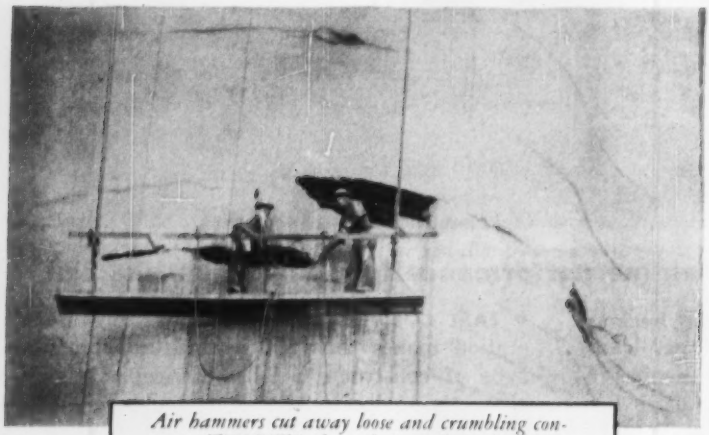
How to save this costly structure, without rebuilding sections, presented a serious problem.

Workmen on scaffolds, from inside and outside, cut out deteriorated concrete.

Necessity of costly forming was eliminated by the use of THORITE 20-minute set, nonshrink, filling and patching mortar.

THORITE

THORITE permits completion of job in one fall of scaffold, followed immediately by THOROSEAL seal coat.



Air hammers cut away loose and crumbling concrete. THORITE formed into cleaned-out sections, with a minimum labor cost, restored elevators to original condition.

Job completed with the application of THOROSEAL over entire structure.

Get our 16-PAGE CIRCULAR

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PA. • CENTERVILLE, IND.

Obituaries

Platt Rogers, 71, builder of Colorado highway, water and other projects, died May 18 at his Colorado Springs home. He was the first president and one of the founders of the Colorado Contractors Assn. After graduation from Yale University, Mr. Rogers went into the construction business in California and moved to Pueblo, Colo., in the 1920s. Among the projects he built were the Twin Lakes diversion tunnel near Aspen, Colo., and the first unit of the Colorado-Big Thompson transmountain water diversion project.

D. B. Gumensky, 58, consulting civil and structural engineer, died May 21. Mr. Gumensky worked mostly in the water resource development field, spending 13 years with the Metropolitan Water District of Southern California on the Colorado River Aqueduct. During World War II he was associated with naval construction work in the Pacific area. In recent years he had positions of major responsibility on water resource developments in China (before Communist occupation) and in Israel. His last affiliation was with Tippetts-Abbett-McCarthy-Stratton of New York. He held degrees in engineering from both the University of California and the University of Southern California.

Carlton P. Roberts, 53, junior partner and chief engineer for the New York architectural firm of Voorhees, Walker, Smith & Smith, died May 27. Mr. Roberts supervised the engineering design for the Savannah River atomic energy plant, the Argonne National Laboratories in Chicago and the Ford Research and Engineering Center at Dearborn, Mich. He received a B.S. degree in physics from Cambridge University, England in 1924 and his Master's from the University of Berlin in 1927.

A. H. Levine, 50, executive vice president of Baltimore Contractors, Inc., died recently at Baltimore. He had just completed a term as president of the local chapter of the Associated General Contractors, and was long a leader in association affairs in the area. As a project manager, and as a member of both his firm's board of directors and its executive committee, Mr. Levine had supervised construction work in many eastern states.

Daniel Brookshire, 80, a retired building contractor of North Wilkesboro, N. C., died May 22.

BIG NEWS in road maintenance:

COLD APPLIED

BITUMULS®

Slurry Seal

Spreader-box application of Bitumuls Slurry is fast and easy.

BITUMULS SLURRY SEAL is a fast, simple, and highly effective technique for getting extra years of satisfactory service out of cracked, worn, or spalled pavements.

The slurry, itself, consists of a mixture of Bitumuls emulsified asphalt and water to which sand or crusher dust (or a combination of both) is added to form a free flowing mix.

Typical Slurry Preparation

On a typical successful operation, the Bitumuls emulsion and water were first fed into the drum of a transit mix truck. Then aggregate, conforming to the following gradation, was added slowly to assure complete coating:

Sieve Sizes	*Per cent Passing*
Number 20	100
" 50	91
" 50	54
" 100	20
" 200	5

Method Of Application

The slurry, delivered to the job in the transit mixer, was chuted into a spreader box, towed behind the mixer truck, onto the pre-watered pavement. (The spreader box was a rectangular, sled-like frame, one traffic lane in width. It was equipped with a rubber strike off, or squeegee blade, which assured even distribution and uniform coating, and forced the slurry into cracks and depressions.)

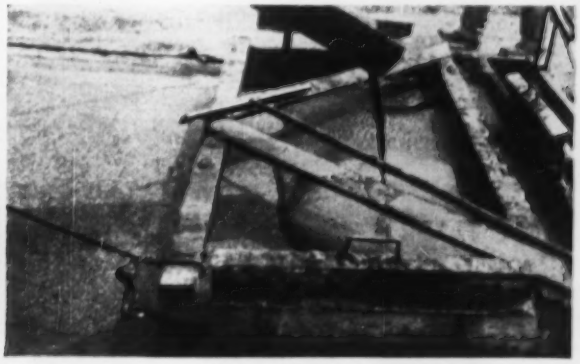
Pioneered In The West

Quickly and easily applied at exceptionally low costs, Bitumuls slurry sets rapidly and can usually be opened to traffic within two to three hours.

This method was pioneered by Los Angeles County forces. Working closely with them were Engineers of American Bitumuls & Asphalt Company.

Bitumuls Slurry Seal has been used effectively in both Southern and Northern California, and test sections have been placed in other areas of the country. The "big news" of this relatively new method of extending pavement surface life is spreading fast. Get full data from our nearest office.

Aggregate and Bitumuls are fed into transit mix truck, then water is added as required.

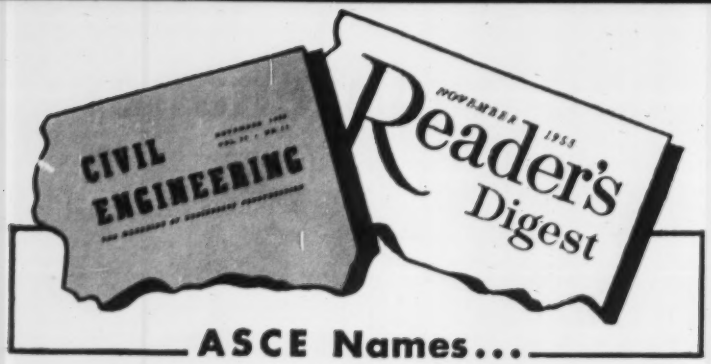


Close-up view of the specially-designed spreader-box.

Leading Marketers of Asphalts, Cutbacks, and Emulsions — Nationwide.

American Bitumuls & Asphalt Company

200 BUSH STREET, SAN FRANCISCO 20, CALIFORNIA • Perth Amboy, N. J. • Baltimore 3, Md.
Cincinnati 38, Ohio • Columbus 15, Ohio • Mobile, Ala. • Tucson, Ariz • Seattle, Wash.
Baton Rouge 2, La. • St. Louis 17, Mo. • Inglewood, Calif. • Oakland 1, Calif.
Portland 7, Ore. • Washington 5, D.C. • San Juan 23, P. R.



ASCE Names...

Sanitary District of Chicago One of "Seven Modern Wonders"

Allis-Chalmers Equipment Employed in this Outstanding Example of Modern American Engineering

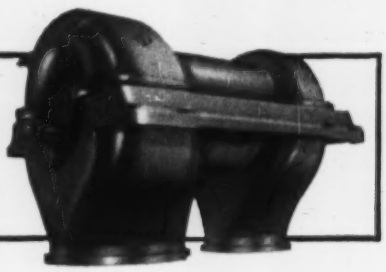
After three years of consideration, the American Society of Civil Engineers has announced the selection of "Seven Modern Wonders of American Engineering." One of the projects selected was the sewage disposal system built up by the Metropolitan Sanitary District of Greater Chicago over the past half century.

The project at Chicago is designed to handle the storm water and wastes from population and industry equal to 7,500,000 people. Using principally the activated sludge process, it treats over a billion gallons of sanitary sewage per day, enough to cover a square mile area to a depth of five feet.

In handling this huge mass of sewage in three great treatment plants and several pumping stations, the Sanitary District depends upon the reliability of Allis-Chalmers equipment, including switchgear, motors and generators, compressors, condenser and steam turbine equipment, and many centrifugal pumps and motors.

Backed by years of research, design and manufacturing experience, Allis-Chalmers can give you the help you need in planning modernization or expansion of your facilities. For further information, call your local A-C office, or write Allis-Chalmers, Milwaukee 1, Wis.

First Axial Blower for a U. S. Sewage Plant

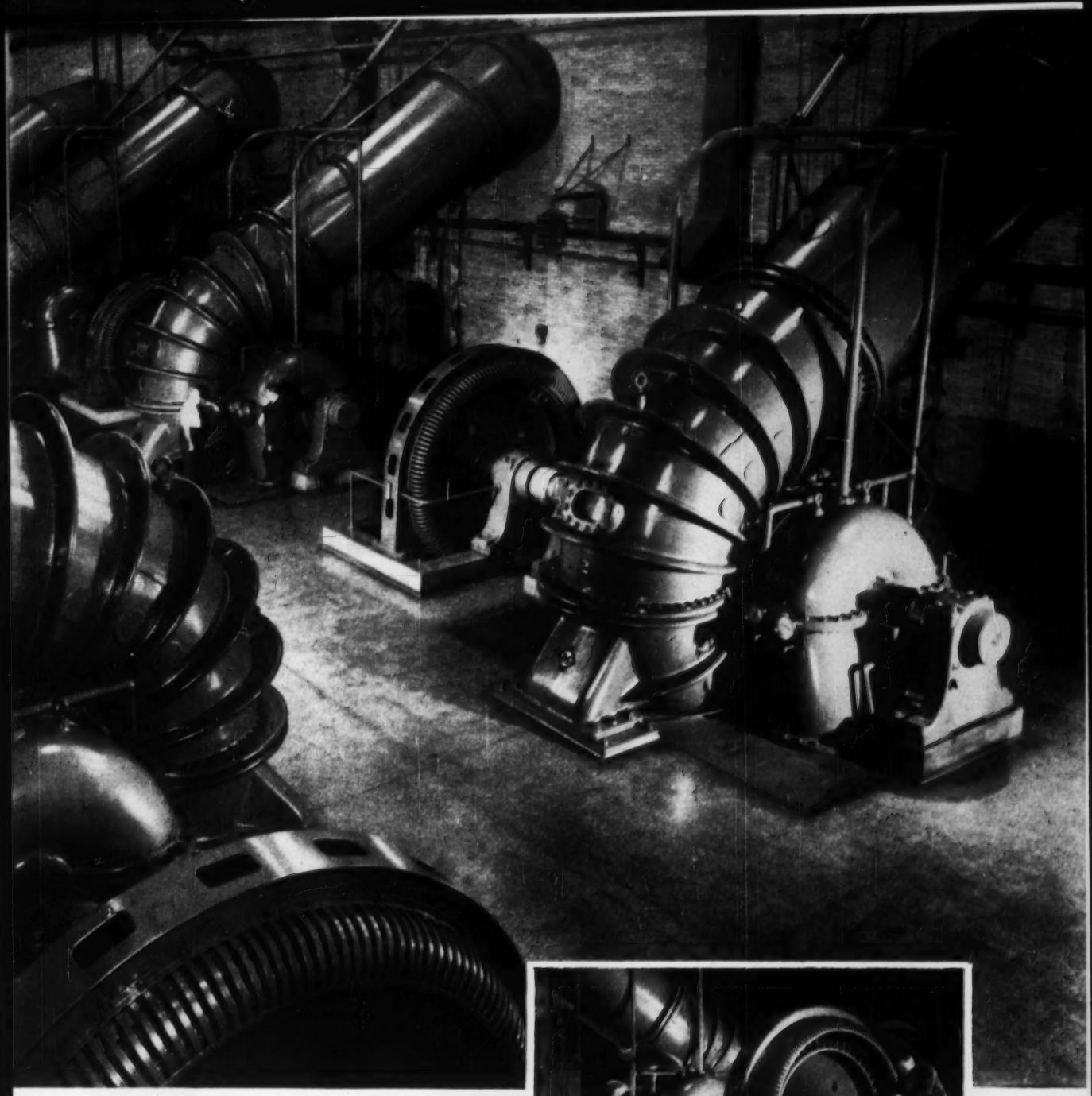


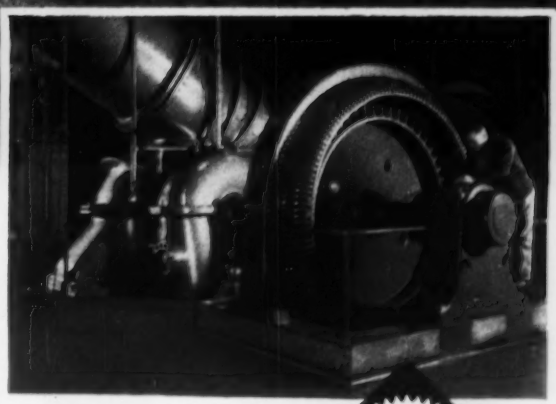
Allis-Chalmers is furnishing a multi-stage axial compressor similar to this for use at the Sanitary District's West-Southwest Sewage Treatment Works.

The 200,000-cfm unit, first ever to be applied to sewage aeration in this country, was selected because of the high operating efficiency inherent in the axial-type blower. It will be driven by an 8250-hp, 3600-rpm Allis-Chalmers steam turbine.

The axial blower will be used for base-load duty, to take advantage of its high efficiency.

ALLIS-





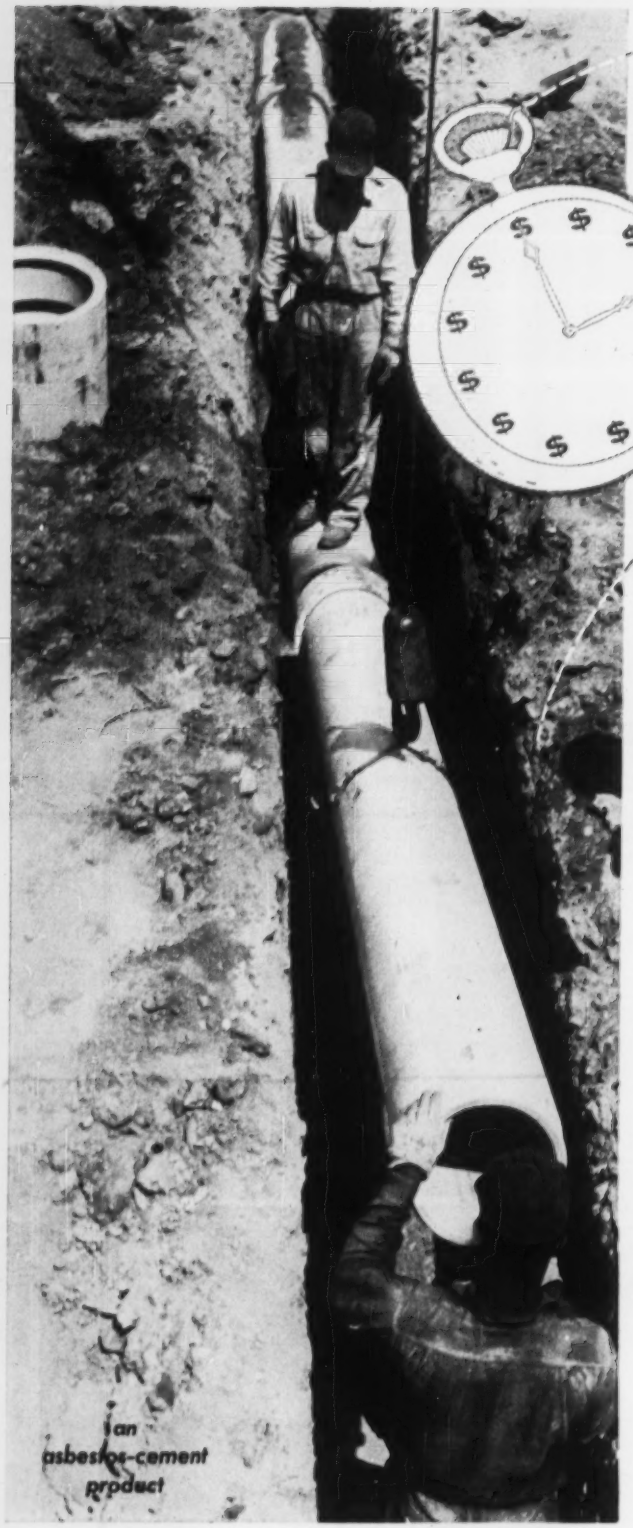
At the Racine Avenue Station, 12 A-C pump-motor units are on sanitary and storm sewage service. Originally four units were installed, but constant growth of the system has dictated tripling the facilities.

The installation now includes twelve 72-inch centrifugal pumps, ranging in capacity from 375 to 500 cfs. They are driven by Allis-Chalmers synchronous motors, ranging in size from 1000 to 1750 hp.

A-6034

CHALMERS

A-C
ALLIS-CHALMERS



Hours saved in the trench
dollars saved on the contract...

...because Transite Ring-Tite Pressure Pipe handles easily, positions automatically

• Transite® Pressure Pipe with Ring-Tite® Coupling is so quickly and easily installed —you save hours of costly trench time . . . shave dollars off job costs!

Transite goes in faster, because the Ring-Tite Coupling speeds and simplifies joint assembly. Workmen simply smooth rubber sealing rings into grooves, lubricate the pipe end, and pull pipe and coupling together. Shoulders on the pipe itself position the ends in the joint automatically The result is a joint with positive seal, yet remarkably flexible! And these rubber rings can't blow out.

Corrosion-resistant

You can assure city officials and engineers of peak performance, year after year. Transite Pipe, an asbestos-cement product is strong, durable, highly resistant to corrosion.

For further information about Transite Pressure Pipe and Ring-Tite Coupling, write for Booklet TR-160A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, Port Credit, Ontario.

Johns-Manville TRANSITE PRESSURE PIPE
WITH THE **RING-TITE** COUPLING

Unit Prices

Asphaltic Highway, Nevada

These 9.717 mi of 32-ft-wide highway in Humboldt County, Nevada, have a contract cost of $547,049. Allen K. Dalby, resident engineer, Winnemucca, Nev., designed this job for the State of Nevada Department of Highways in Carson City.

The contract went to Gibbons & Reed Co. of Salt Lake City, Utah, whose low bid was only 0.4% below the second low bid and 11.4% below the high of six bids.

Work under the contract includes grading and drainage, a gravel base course of various thickness, and a 3-in. plantmix asphaltic surface.

Class A concrete has to test at 3,000 lb in 28 days.

Minimum wage rates for skilled labor are $2.35, for semi-skilled labor $2.15, and for common labor $2.025.

1C	Gibbons & Reed Co., Salt Lake City, Utah	$547,049
2	Dodge Const., Inc., Fallon, Nevada	548,185
6	Silver State Const. Co., Fallon, Nevada	617,444

Bids: 3-15-56 Items	Unit	Quantity	Unit Prices 1C	2
Signs	ls	job	$1,000	$2,000
Flagman	hr	4,000	2.65	2.50
Pilot car	hr	40	3.20	5.00
Special detour, maintain	FA*	job	250.00	250.00
Detour surf, select	cy	2,663	0.80	0.90
Culv pipe, remov	lf	2,141	1.00	1.50
Headwalls, remov	ea	84	30.00	15.00
Inlets, remov	ea	1	60.00	50.00
Excav, roadway, A	cy	130,669	0.79	0.91
B	cy	103,776	0.27	0.30
drainage	cy	290	1.00	1.00
Ditches, V-type	sta	238	7.00	5.00
Slope rounding	sta	85	7.00	10.00
Overhaul, sta yd	ea	746,088	0.02	0.02
mi yd	ea	16,641	0.16	0.20
Excav, struct	cy	750	1.50	2.00
Backfill	cy	2,030	1.75	1.50
Water	mgal	12,253	1.80	0.75
Water equip, f	ls	job	6,000	18,500
Power roller	hr	78	8.00	6.00
Tamp or pneumtc tired roll	fthr	9,552	0.75	0.40
Gravel base, type 1	t	79,905	0.96	1.00
type 2, 1"	t	32,631	1.06	1.08
Asphalt, liquid, type MC-1	t	301	45.00	40.00
emulsf, type MS-1	t	39	44.00	40.00
type RS-2	t	170	42.00	40.00
Screenings, 3/8"	t	1,378	4.00	5.00
Asph cmt, 120-150 penetrn	t	1,606	39.00	32.50
Plantmix surface, cl F-2	t	29,242	2.70	2.60
paved ditches	sy	28	0.35	1.00
shoulder dike	lf	3,810	0.60	0.35
Conc, cl AA	cy	33	100.00	100.00
Steel, reinf	lb	580	0.20	0.20
CMP, dipped, 8"	lf	158	3.00	2.50
24"	lf	950	6.80	6.00
30"	lf	144	8.00	7.50
36"	lf	1,052	12.50	11.50
arch, dipped, 43x27"	lf	202	16.00	15.00
Pipe, culv, relay	lf	152	1.00	1.50
headwalls, mov.	ea	6	35.00	25.00
Guard rail, std stl	lf	6,550	3.15	3.10
remov	lf	380	0.60	1.00
Culv markers & gd posts	ea	215	7.00	6.00
Monuments, reference	ea	50	7.00	7.50
Markers, ROW	ea	50	7.00	7.50
Embkmt protector, dip	ea	5	50.00	35.00
Misc work	FA	job	1,400	1,400

* FA Force Account
Time to complete: 175 working days
Liquidated damages: $100.00 per day

Site Preparations for Stadium, Minnesota

To prepare about 62 acres for the construction of the Municipal Sports Stadium will cost the city of St. Paul, Minnesota, $328,812. This price includes excavating, grading, surfacing, sewer and water mains, drainage, and an underground sprinkler system for the playing field. A. H. Schroeder is city architect and Toltz, King, Duvall, Anderson & Associates, Inc. of St. Paul are consulting engineers and architects.

The successful bid came from Thornton Bros. Co., St. Paul, who underbid the engineer's estimate by 6.3%.

Cast iron pipe has to qualify to ASTM standards 150#.

Wage rates are $3.10 for skilled labor, $2.65 for semi-skilled and $2.25 for unskilled labor.

The five bidders include:

1C	Thornton Bros. Co., St. Paul, Minn	$328,812
2	Ashbach Construction Co., St. Paul, Minn	368,387
5	Kraus-Anderson of St. Paul Co.	423,137
EE	Toltz, King, Duvall, Anderson & Associates	350,890

Bids: 3-6-56 Items	Unit	Quantity	Unit Prices 1C	2
Clear & grub	ls	job	$800.00	$560.00
Excav, common	cy	234,000	0.28	0.275
Water	Mgal	2,400	3.50	3.54
Topsoil	sy	35,000	0.26	0.27
Base crse agg, 4"	sy	131,300	0.30	0.71
Bit matl for prime coat	gal	65,650	0.20	0.18
Asph conc	t	4,096	10.00	8.00
Asph cmt	t	307	25.00	30.45
Bit matl for seal coat	gal	41,600	0.20	0.20
Agg, seal coat, for walks	t	190	10.00	7.08
for parking areas	t	1,310	8.00	5.31
Culv, CMP, 15"	lf	90	2.60	3.45
30"	lf	326	5.75	7.03
Apron, met, for 15" culv	ea	2	18.00	21.30
30" culv	ea	5	48.00	53.40
Riprap	cy	14	22.00	8.85
Storm sewer, 0-10' deep VCP, 8"	lf	308	3.19	1.59
12"	lf	718	3.49	3.42
RCCP, 12"	lf	347	4.48	4.13
15"	lf	549	5.18	4.72
18"	lf	500	5.79	5.42
21"	lf	260	7.03	6.78
24"	lf	800	8.22	7.96
30"	lf	440	10.24	10.90
Tees, VCP, 12x8"	ea	8	13.12	8.85
Catch basins	ea	8	250.00	272.60
Manholes	ea	15	225.00	225.70
Drop inlet	ea	1	80.00	65.00
Curb inlet	ea	7	55.00	43.66
Field drains	ea	8	65.00	24.66
RCCP end sect, flared, 24"	ea	1	50.00	42.50
30"	ea	1	60.00	56.80
Water main, incl pipe gate valv, boxes, hydr, fittings & incidentals	ls	job	25,940	23,274
San sew force main incl MH, gravty conn to exist sew, CIP force main, fittings & incidentals	ls	job	7,115	5,900
Curb, conc	lf	2,830	2.00	0.94
Island, conc	ea	8	220.00	256.00
Walk, conc, 4"	sf	9,550	0.60	0.44
Guard posts,	ea	1,420	4.85	4.18
Chain link fence, 72", with 3-strand barb wire top	lf	2,780	3.00	3.05
Gate, 10' wide	ea	1	160.00	165.00
Sodding	sy	11,575	0.50	0.53
Strip sodding	ac	7.2	416.00	1,267
Seeds, mixt	lb	900	1.25	1.00
Fertilizing	ac	7.2	60.00	124.00
Seeding	ac	7.2	93.75	82.60
Cover crop incl seeds	ac	7.2	85.00	106.20
Sprinkler syst, undergr, playing field	ls	job	17,150	18,320

Work started: 3-15-56 To be completed: 10-15-56
Liquidated damages: $25.00 per day

Waterstop *in place in seconds!*

LABYRINTH WATERSTOP after first pour has been made and form removed. The grooves receive the concrete from the second pour, providing an interlocking joint.

Just a few seconds were needed to nail this LABYRINTH WATERSTOP to the form... just a few seconds and water seepage worries were over before they could ever have a chance to start.

LABYRINTH WATERSTOP forms a waterproof bond between two pours. The corrugated ribs bond firmly with the concrete.

LABYRINTH WATERSTOPS are made of flexible polyvinyl plastic... that has superior weathering qualities, is not affected by temperature changes and chemical activity.

LABYRINTH WATERSTOPS are easy to work with, can be cut to any desired length. "L" and "T" joints can be welded with just a hot knife. Find out now how your costs can be cut... and end your seepage problems. Just mail the coupon to:

WATER SEALS, *inc.*
9 SOUTH CLINTON STREET
CHICAGO 6, ILLINOIS

Made in Canada for
J. E. Goodman Sales Ltd.
Toronto, Ontario

WATER SEALS, INC. DEPT. 4
9 South Clinton Street
Chicago 6, Illinois

Send full information and sample

Name_____

Company_____

Address_____

City_____ Zone____ State____

Materials and Labor Prices — Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

* June 21 — Wood Products, Glass, Explosives, Chemicals
* June 28 — Clay Products, Lime, Plaster, Paint, Roofing, Wage Rates, Building Board, Lath, Insulation
* July 5 — Cement, Aggregate, Ready-mixed Concrete, Asphalt

IRON AND STEEL PRODUCTS — PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES	PLATE CARBON STEEL	REINF BARS billet	RIVETS ½-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$4.60	$4.50	$4.65	$9.25		$94.50	$113.00	$5.825	$7.90	$5.625	.....
Chicago Area	4.60	4.50	4.65	9.25	$5.45	94.50	113.00	5.825	7.90	5.625	.....
Pittsburgh Area	4.60	4.50	4.65	9.25	5.45	94.50	113.00	5.825	7.90	5.625	$11.50
Buffalo Area	4.60	4.50	4.65	9.25	5.45	94.50	113.00	5.825	7.90	5.625	11.50
Cleveland	.....	.....	4.65	9.25	5.45	.....	.....	.....	.....	.....	11.50
Youngstown Area	.....	.....	4.65	.....	.....	.....	.....	.....	7.90	.....	.....
Geneva	4.60	4.50	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	.....	.....	.....	.....	5.45	.....	.....	.....	7.90	.....	.....
Pueblo	4.90	5.35	5.10	.....	.....	.....	95.00	5.825	7.90	5.625	12.40

IRON AND STEEL PRODUCTS — F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Rail steel	EXPANDED METAL LATH‡ Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	EXPANDED METAL LATH‡ Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	$8.44		$8.85c	$50.00	$55.00	
Baltimore	8.03	7.52f		39.00	43.50	
Birmingham	7.28t	7.12t	7.12t	61.00p	67.00p	
Boston	8.27a	7.82	7.82	44.00	48.50	4 × 16 in., No. 5 & 10 wires — Joliet, Ill., Donora, Pa., Monessen, Pa. $3.40
Chicago	7.43	6.23gu	6.23gu	49.00‡	60.00‡	
Cincinnati	7.90ak	7.56rs		41.00mn	45.50mn	4 × 12 in., No. 8 & 12 wires — Joliet, Ill., Donora, Pa., Monessen, Pa. $2.22
Cleveland	7.76	6.41c		41.00‡	45.50‡	
Dallas	9.05	7.40	7.40	49.00	52.00	
Denver	8.95	8.00c		54.00n	60.00n	6 × 6 in., No. 6 & 6 wires — Joliet, Ill., Donora, Pa., Monessen, Pa. $3.67
Detroit	7.90	7.38		56.00	63.00	
Kansas City	7.95a	7.75		49.00	60.00	
Los Angeles	8.30fd	7.75		54.50	60.50	
Minneapolis	7.83d	8.14b	8.14b	42.50	47.00	
Montreal	7.70-8.15fC/7.75-8.15A	7.50/8.65x	7.50/8.65	65.00A	70.00A	
New Orleans	.....	7.05aks		44.50	49.50	
New York	8.21	7.35y**	7.35y**	44.50no	51.00no	
Philadelphia	8.04	7.14		42.50‡	47.00‡	
Pittsburgh	7.43	6.57**		42.50	47.00	
St. Louis	7.83s	7.35c	7.35c	57.00f	59.00f	
San Francisco	8.55	7.55j		47.50	53.00	
Seattle	8.50†	7.70r		55.00nr	61.00nr	
Toronto	8.40*	7.25	7.25	53.50nq	67.50nw	

Quantity extras, per cwt: under 100, + $5; 100-399, + $3; 400-999, + $1.25; 1000-1999, + 30c; 2000-4999, base price; 5000-9999, — 10c; 10,000-19,999, — 30c; 20,000-29,999, — 50c; 30,000 and up, — 70c.

EXTRAS, per cwt — *Quantity: less than 700, + 50c; 700-1499, + 25c; 1500-7999, + 10c. *Size: #2 + $2.20; #3 + $1.10; #4 + 50c; #5 + 62.5c; #6, #7 + 45c; #8, #9, #10, #11, #14 + 35c. *Bending: heavy, + $2 except in New York City and surrounding metropolitan area where bending must be done on the job). *Engineering (details and placing from designs by others): over 500 tons, + 45c; 200-500 tons, + 50c but not over $4500; 20-200 tons, + 60c but not over $2000; 5-20 tons, + 70c but not over $240; under 5 tons, + 85c but not over $70. *Design only: + 60c.

*† Delivered *a 2000-9999# *b 10,000-15,999#, fob city *c 20 tons or over *d 10,000-19,999# *e Intermediate struct'l *f Incl. delivering in free zone *g CL *h list price; dominion tax exempt; add provincial and municipal taxes *i add dominion, provincial and municipal sales taxes *j Intermediate and hard grade *k fob city *l delivered; contractor to do unloading *m copper alloy *n LCL *o asphalt coated *p del. of 500 sq. yd. or more. *q 3 lb *r 2% off for cash *s 2,000-4,999# *t add 15¢ del. *u add 6.25¢ switch *v incl 15¢ del. *w 3.5 lb *x add 5¢ switch *y add 30¢ del. *z add 10¢ del. *A American made. *C Canadian made. † Previous prices for struct'l was fob mill. Previous prices for bars was intermediate & hard grade ** Aver. of Canadian & American. ** 4 tons

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEXes	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 6" Pr Cl. 150	ASBESTOS CEMENT PIPE 12" Sew Cl. I	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13-44T std. 8 in. s.s.	std. 12 in. s.s.	24 in. ds.	36 in. ds.	CLAY DRAIN TILE ASTM C4-24 PER 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTMC 14-41 12 in.	24 in.
Atlanta	117.6	$1.56	$2.60	$.55	$1.30	$4.95	$12.25	$225.00		$0.88m	$3.25m
Baltimore	127.1	1.56	2.60	665	1.28	5.05e	12.71	187.80	$289.20	1.01	2.75m
Birmingham	113.1	1.56	2.60	44	81	3.55w	10.37w	260.00‡	440.00‡	1.90m	4.00
Boston	129.8	1.58	2.39	788grt	1.502grt	6.211grt		203.40r	312.60r	1.54mg	3.65mg
Chicago	127.5	1.56	2.39	90m	1.74m	6.25m	19.00m	150.00‡	270.00‡	1.00	3.65
Cincinnati	122.3	1.58	2.47	665t	1.282Sf	4.905f	12.505	240.00	370.00	80m	2.95m
Cleveland	128.3	1.58	2.47	567s	1.0935s	4.545f	11.787f	149.40m	231.60m	85m	3.25m
Dallas	124.6	1.58	2.73	439	799	4.00b	9.17b			49	1.60
Denver	134.2	1.66	2.73	47n	84n	3.73n				74m	2.50m
Detroit	128.6	1.58	2.47	85	1.65	6.45	17.50	240.00m	370.00m	95	3.82
Kansas City	125.2	1.58	2.47	61	1.105	4.54	12.75	250.00	480.00	90	2.90
Los Angeles	134.8	1.66	2.39	67f	1.46f	5.97f	14.89f	228.20f	348.90f	1.02	3.02f
Minneapolis	136.1	1.61	2.60	83mo	1.50mo	6.50mo				1.66A	4.47A
Montreal				1.02u	1.80u	6.30u	12.00u			1.17A	3.11j
New Orleans	120.2	1.56	2.60	51	925	5.18		350.00p	550.00p	75	2.50
New York	125.6	1.58	2.39	94	1.78	6.96	18.14			1.15	3.00
Philadelphia	125.0	1.56	2.39	65	1.25	4.95z	12.65z	300.00‡	350.00‡	1.60A	3.95A
Pittsburgh	129.4	1.58	2.39	468m	864m	3.86m	9.78m	152.00	244.00	1.05A	2.50A
St. Louis	123.7	1.56	2.47	56	1.03	4.22	9.80	180.00f	380.00f	1.30f	2.80f
San Francisco	134.8	1.66	2.39	74d	1.62d	6.59d	16.47d	235.00f	392.00f	1.05m	3.30m
Seattle	135.4	1.66	2.39	66b	1.26b	6.34	17.90	205.00c		1.00k	3.10k
Toronto				76	1.425	5.70		157.00	280.00	87	3.05

*WROUGHT STEEL PIPE (Full standard weight) Discount from list; see footnote

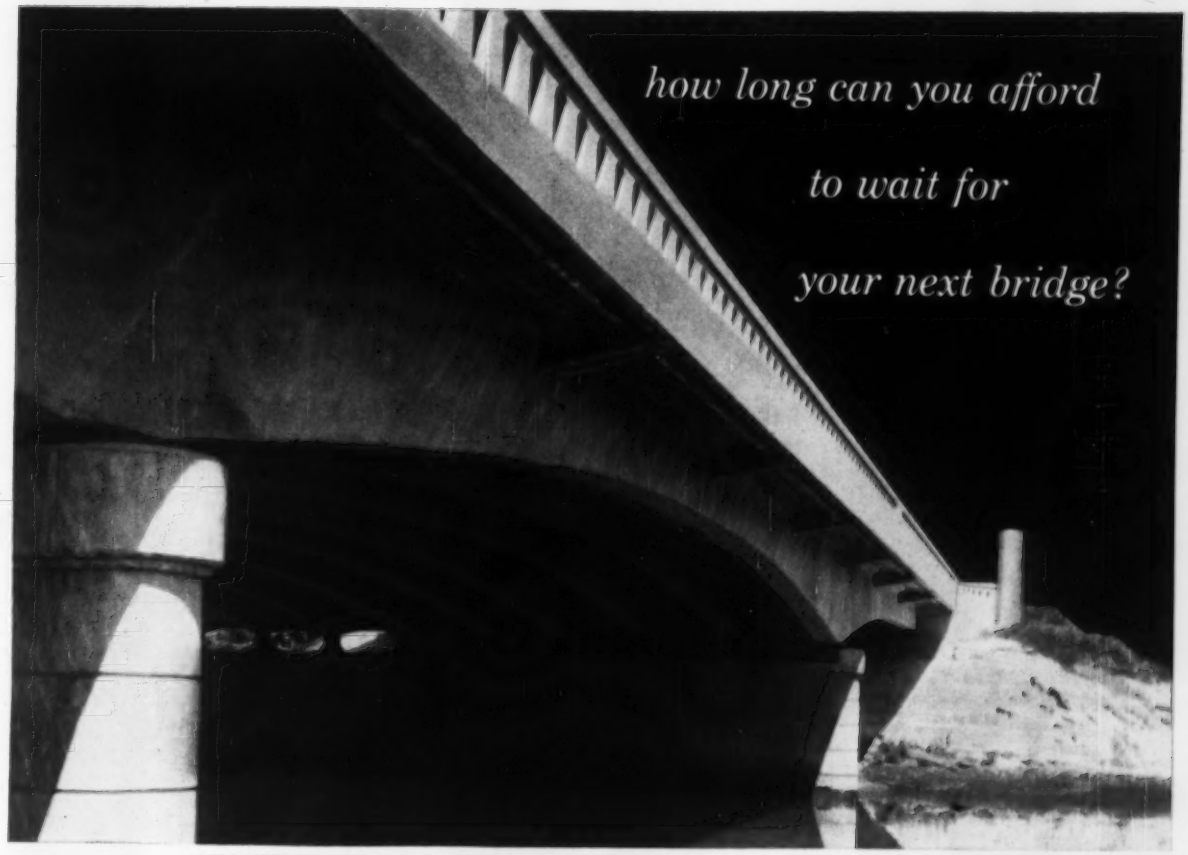
Mill	3½ to 6 in.; Lap Weld† Galv. %	3½ to 6 in.; Lap Weld† Black %	2½ & 3 in.; Butt Weld† Galv. %	2½ & 3 in.; Butt Weld† Black %
Lorain, Ohio	5 25a	19 50a	11 75	29 00
Aliquippa, Pa	+5 25	13 50a	15 25	29 00
Sparrows Pt., Md			8 75	29 00
Benwood, W. Va			10 75	29 00
Youngstown, O	+0 75d	19 50d	10 75	29 00
Indiana Harbor, Ind	+0 25a	18 50ab	9 75	28 00
Sharon, Pa		19 50n	10 75	29 00
Wheatland, Pa	+0 75n	13 50n	10 75	29 00
Etna, Pa	+0 25d	17 50d	13 25	29 00
Fontana, Calif	+?	? (0ab)	2 75b	16 50b

† Threaded and coupled. a 8½ to 4 in. b Continuous weld. c 5 and 6 in. d 6 in.

*† Delivered. *a PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 113.1; Burlington, N. J., 122.0. *b Extra strength ASTM C 200-44T *c 4-in., $113 *d SS361-A *e 30-in. *f 21 in. *g culvert pipe; reinforced, ASTM C 76-41 *h reinforced, ASTM C 75-41 *i reinforced, ASTM C 76-37 *j centrispun; no standard specs. in Canada *k 2% off for cash *l fob plant *m truck delivery *n LCL delivered, fob truck *o listed price based on LCL (no min.) *p freight allowed to destination in city *q ASTM C 13-40 *r CL fob origin, freight allowed *s 2 ft lengths *t 3 ft lengths *u CESA A 60-1941 specs. used *v standard strength *w ss; add 20% for d.s.

* WROUGHT STEEL PIPE: Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft. (based on approx. $200 per net ton): Butt Weld ⅛ in., 5½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight rates plus 3% transportation tax to get destination price.

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld — 1 in. black, + 61.25, galv., + 89.50; 1¼ in. black, + 61.25, galv. + 89.0, 1½ in. black, + 57.75 galv. + 85.25; Lap Weld — 2½ in. to 3 in. black + 63.50 galv. + 89.50; 4½ in. to 6 in. black + 60.50 galv. + 84.75 Add freight rates plus 3% transportation tax to get destination price.



BRIDGES START QUICKER . . .
ARE COMPLETED SOONER WITH

REINFORCED CONCRETE

Reinforced concrete bridges start quicker because all necessary materials are readily available from local stocks. These faster starts, made possible with reinforced concrete, save months of delay.

Furthermore, cost studies are proving, time and time again, that reinforced concrete offers lower over-all costs. Important, too . . . reinforced concrete is a flexible medium that permits an infinite variety of imaginative and graceful designs. You can design multiple overpass bridges with bold, dramatic lines and shadow . . . soaring curves and a light, airy touch.

Structures built with reinforced concrete are rugged . . . highly resistant to wind, shock, and quake. They are more weather resistant, and require less maintenance.

On your next bridge or overpass, design for rugged beauty plus economy . . . design for REINFORCED CONCRETE!

Three-span, continuous deck girder bridge of reinforced concrete carrying Route 100 over U.S. 52 to Route 218, in Invergrove Township, near St. Paul, Minnesota.

Designed by the Department of Highways, State of Minnesota.

Contractors: Harold Purtell Construction Co., St. Paul, Minn.

Compare . . . YOU'LL SAVE WITH REINFORCED CONCRETE

CONCRETE REINFORCING STEEL INSTITUTE

38 South Dearborn Street • Chicago 3, Illinois

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

Conn., Willimantic—BA 6/22—City, City Hall, 11,000 lin. ft. sanitary sewers, pump house and equip. CD 7/31/47.

BUILDINGS—BA

Conn., Wethersfield—SCHOOL—BA 6/19—Town, School Bldg. Comm., 200 Main St., Valley Crest Elementary School. $490,000. Plans deposit $50. Irving W. Rutherford, 49 Garden St., archt. CD 1/24.

Mass., Hampden—SCHOOL—BA 6/21—Town, School Bldg. Comm., Lawrence Foster, chn., brick, 12 classrooms, elementary school. $345,000. Alderman & MacNeish, 504 Riverdale St., West Springfield, archts.

BUILDINGS—SLC

Conn., Bloomfield—BANK—Connecticut Bank & Trust Co., 760 Main St., Hartford, soon lets contract branch bank, Wintonbury Ave. and Jerome St. $500,000. Andrew F. Euston, 153 Court St., New Haven, and George C. Kibbe, 412 Westover Terrace, Simsbury, archts.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston.

A. Rotondi & Sons, 140 Franklin St., Stoneham, Mass. LB $1,867,497, est. $1,900,000. Proj. 939 reconstr. Middlesex Falls Parkway, Wellington Bridge to Roosevelt Circle, Medford and Malden. Bids May 31. CD 5/16.

Pittsburgh-Des Moines Steel Co., 1060 Broad St., Newark, N. J. LB $64,600, est. $70,000. Contr. No. 4, elevated water tank, IPSWICH, MASS. Town, South Main St., Ipswich, Mass. Bids May 25. CD 5/16.

† **L. D. Short**, 225 Cooper St., Agawam, Mass., CA $99,928, est. $100,000. access roadway, etc., airfield, WESTFIELD, MASS. Property & Fiscal Officer, 905 Commonwealth Ave., Boston, Mass. Alderman & MacNeish, 594 Riverdale Rd., West Springfield, Mass., archts.

Town, Sanitary Dist. Comn., Town Hall, Johnston, R. I., rejected bids Apr. 30. Contracts 3, 4 and 5, sanitary sewers, JOHNSTON, R. I., est. $300,000. Will readvertise. CD 5/9, under LB.

CONNECTICUT—State Hy. Comn., State Office Bldg., Hartford.

Conn.—**Angelo Tomasso, Inc.**, Warren St., New Britain, Conn., LB $224,822. Proj. 160-71, b. conc. resurf. 25,699 lin. ft. Wilbur Cross Parkway, Wilmington, Ashford and Union. Bids May 28. CD 5/18.

CONNECTICUT—State Hy. Comn., State Office Bldg., Hartford.

Conn.—**Paul Bacco & Son, Inc.**, 758 Summer St., Stamford, Conn. LB $337,970, Proj. 102-79, bridge, approaches Broad St. over Norwalk River, Norwalk;

Conn.—**DeFonce Constr. Co., Inc.**, 110 Colonial Ave., Bridgeport, Conn.; LB $178,285, Proj. 10-56 Location 17, bridge, approaches Magnolia Hill Rd. over East Spring Brook, Bethlehem; Location 60, bridge, approaches at Church Hill over Shepaug River, Washington; Location 62, bridge, approaches W. Morris Rd. over Bantam River, Washington; Location 63, bridge, approaches, on Romford Rd. over Shepaug River, Washington;

Conn.—**John DeMichiel & Bros. Inc.**, 58 High St., Torrington, Conn., LB $148,905, Proj. 21-69, Location 12, bridges, approaches at Cobble Rd. over Hollenbeck River, Canaan; Location 4, bridges, approaches, Canaan, Southfild Rd. over Konkapot River, Canaan & North Canaan;

Conn.—**C. H. Nickerson & Co., Inc.**, Hayden Hill Rd., Burrville, Conn., LB $87,414. Proj. 31-85. Location 28, bridge, approaches on Lieb Rd over Hollenbeck River, Cornwall; Location 6, culverts, approaches on Town Hill Rd. over West Branch Bantam River in Goshen, Location 38, culverts, approaches on Purrvis Rd. over Spruce Brook in Litchfield;

Conn.—**Brunalli Constr. Co.**, Summer St., Southington, Conn., LB $221,182, Proj. 143-64. Location 2, bridge, approaches, Brass Mill Dam Rd. over West Branch Naugatuck River, Torrington; Location 26, culvert approaches at Winthrop St. over Troy Brook in Torrington; Location 33, culvert approaches, Lovers Lane over Lovers Lane Brook, Torrington; Location 22, culvert, approaches Gray Rd. over North Brook, New Hartford; Location 36A, abutment replacement at bridge on Old West Hill Rd. over Carter Brook, New Hartford. Bids May 28. CD 5/18.

BUILDINGS—LB & CA

Lord & Miller, Inc., 68 Essex St., Melrose, Mass., CA $442,000. BANK, PORTSMOUTH, N. H. Portsmouth Savings Bank, Norman E. Rand, pres., 22 Market Square, Portsmouth, N. H. CD 2/6.

Owner, c/o Joseph Connolly, 514 River St., Mattapan, Mass. Owner Builds. $360,000. RESIDENTIAL and SUMMER COTTAGE DEVELOPMENT "Harbor Coves," 35 residences, CHATHAM, MASS.

Tredennick-Billings Co., 10 High St., Boston, Mass. CA Approx. $95,000. TRAINING AND MAINTENANCE BLDG., Lincoln Laboratory, LEXINGTON, MASS. International Business Machine Corp., c/o Cleverdon, Varney & Pike, engrs., 120 Tremont St., Boston, Mass.

William Porter Co., Inc., 84 Arsenal St., Watertown, Mass. CA Approx. $120,000. MANUFACTURING BLDG., Woerd Ave., WALTHAM, MASS. W. H. Nichols Co., 48 Woerd Ave., Waltham, Mass., Bids May 22. CD 5/8.

▲ **Gilbane Building Co.**, 90 Calverly St., Providence, R. I. CA, $1,500,000. HOSPITAL WING Addn., PROVIDENCE, R. I. Providence Lying In Hospital, 50 Maude St., Providence, R. I. Bids Apr. 10. CD 4/6.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

† **Md., Cumberland**—SECOND FLOOR—BA 6/19—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va., second floor addn., 38x64 ft. masonry structure, Allegany Ballistics Laboratory, NBy 3626, Spec. 3626/56. Plans deposit $25.

BUILDINGS—LB & CA

N. Y., Brooklyn—MAIN BLDG. AND LABORATORY—BA 6/20—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, general constr., plumbing work, heating and ventilating work, electric work and lighting fixtures for rehabilitation and modernization of main bldg. and laboratory bldg. located at Greenpoint Hospital, Skillman, Debevois and Kingsland Aves. and Jackson St. Plans deposit $50. CD 11/12/54.

N. Y., New York—LAUNDRY—BA 6/27—Dpt. P. Wks., Municipal Bldg., Zone 7, general constr., plumbing work, heating and ventilating work, electrical work, for Welfare Island laundry bldg. expansion, Welfare Island, Manhattan Boro. Plans deposit $50. CD 10/17/50.

BUILDINGS—SLC

N. Y., Syracuse—CHURCH—St. Vincent dePaul R. C. Church, Vine St., soon lets contract rebuild church. $500,000-$600,000. Peterson & Heuber, Syracuse Kempe Bldg., archts. CD 12/20.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**

PROPOSED WORK

Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In Those Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
ENR	**Engineering News-Record**
CD	**Construction Daily**

For additional reports see Construction Daily.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—John W. Johnson, supt. State Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany.

Harrison & Burrowes, Inc., 507 Summit Ave., Jersey City, N. J. CA $1,569,941. constr. 2 bridges, approaches one to carry Rte. 370 over D. L. & W. R. R. in Baldwinsville and one to carry route over Seneca River, near Cold Spring, Onondaga Co. CD 5/15, under LB.

NEW YORK—John W. Johnson, supt. State Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany.

Potter-DeWitt Corp., Pavilion, N. Y. CA $624,762. constr. 2 sects. 3.18 mi. on Rte. 19 from South Warsaw to Rock Glen and from Rte. 19A intersection southwestward on new location to Rte. 78 intersection, Wyoming Co. CD 5/15, under LB.

† **Michael Contg. Co.**, 142 19 St., Brooklyn 32, N. Y. LB $944,888. (11 bidders) constr. Special AAA facilities at Amityville. ENG-30-075-56-15, NEW YORK. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids May 29. CD 5/9.

Kendall Roadways, Inc., 1375 William St., Buffalo, N. Y. LB $136,406. paving William St. from Babcock St. to city line, BUFFALO, N. Y. City, Dpt. P. Wks., Geo. J. Goetz, comr., City Hall, Buffalo, N. Y. Bids May 24.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

Md.—**Contee Sand & Gravel Co.**, Laurel, Md., LB $580,305 (5 bidders) multiple span dual steel beam bridges to carry Baltimore Co. beltway over P. R.R. 5 W. Blvd. and Leeds Ave., 650 ft. long, 37 ft. wide, Contr. B 635-55-420, Baltimore Co.;

Md.—**Allied Contractors, Inc.**, 204 E. Preston St., Baltimore 2, Md. LB $130,857 (4 bidders) wid'n. 3 span beam bridge over B & O R.R., Contr. M 517-6-320, Montgomery Co. Bids May 29. CD 5/16.

BUILDINGS—LB & CA

Greenwood Estates Homes, c/o Ackerman & Harris, 4062 Reardon Pl., Seaford, N. Y. Owner Builds. $375,000. 25 HOUSES on tract on Jericho Turnpike, COMMACK, N. Y.

Rollingwood Park Homes, c/o Edward J. Toner, 2116 Hempstead Turnpike, East Meadow, N. Y. Owner Builds. $400,000. 20 HOUSES on tract at Tulane St., FARMINGDALE, N. Y.

Carl C. Grimm, 259 Delaware Ave., Buffalo, N. Y. LB $687,390. installing sanitary facilities for MEDICAL-SURGICAL BLDG., Gowanda State Homeopathic Hospital, HELMUTH, N. Y. Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany, N. Y. (Correction-low bidder). CD 6/1, under LB.

Hollywood Estates Homes, c/o John P. Muckridge Realty, 258 Hempstead Turnpike, Franklin Square, N. Y. Owner Builds. $540,000. 20 HOUSES on tract at Jericho Turnpike east of South Oyster Bay Rd., SYOSSET, N. Y.

▲ **Byrne Constr. Co., Inc.**, 690 Robineau Rd., Syracuse, N. Y. LB $1,092,569. PARKING GARAGE, SYRACUSE, N. Y. E. W. Edwards Dept. Store, S. Salina St., Syracuse, N. Y. Bids May 22. CD 5/17.

R. D. Golden, P. O. Box 1027, Troy, N. Y. CA Approx. $760,000. girls' DORMITORY, TROY, N. Y. Russell Sage College, Troy, N. Y. Bids May 15. CD 5/14.

▲ **Micoloff Homes Corp.**, 1179 Kenmore Ave., Buffalo, N. Y. Owner Builds. $2,000,000. Westgate Park Subdivision, 139 HOMES, in Michael Rd., WEST SENECA, N. Y.

Peck & Del Vechio, c/o Pecorella Agency, 164 Williams Ave., Hasbrouck Heights, N. J., Owner Builds $725,000. 42 HOMES, second section, South River Gardens, Prospect and Monush Sts., SOUTH RIVER, N. J. Leonard G. Feinen, 320 Lincoln Ave., Hasbrouck Heights, N. J., archt.

James Keelty & Co., Inc., 5716 York Rd., Baltimore 12, Md. Owner Builds. $680,000. 68 two story, brick DWELLINGS, Old Trail, Rogers Forge Development, BALTIMORE, MD.

Laird, Rock & Small, Inc., 701 Hampton Lane, Towson 4, Md. CA $350,000. 14 DWELLINGS, Sleepy Dell Rd. and Gypsy Lane, Hampton Village, TOWSON, MD. Bay Country Developers, Inc., 701 Hampton Lane, Towson 4, Md.

Merando, Inc., 4098 Minnesota Ave. N. E., Wash., D. C., LB $788,450 (8 bidders) Elementary SCHOOL, vicinity of 6 St. and Riggs Rd. N. E., WASH., D. C. D. C. Govt.; Director Bldgs. & Grounds, 499 Pa. Ave. N. W., Wash., D. C. Bids May 29. CD 5/17.

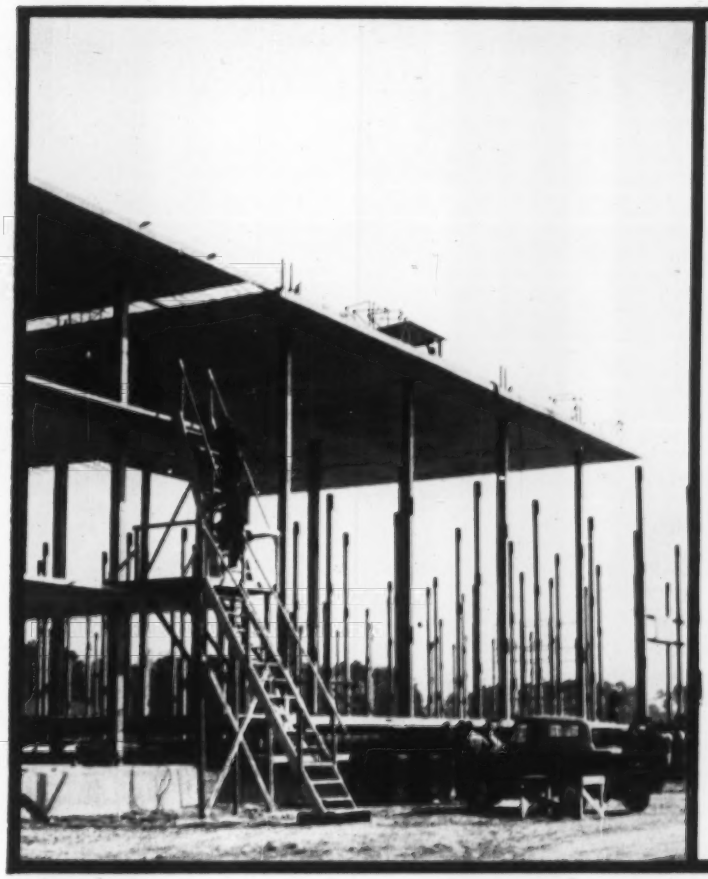
SOUTH

HEAVY CONSTRUCTION—BA

† **N. C., Edenton**—SHOP—BA 6/19—Pub. Wks. Office, Fifth Naval Dist., U. S. Naval Dist., Norfolk 11, Va., 1 story, masonry public works shop, Naval Auxiliary Air Station, NBy 3550. Plans deposit $25. CD 10/10.

† **Va., Arlington**—BA 6/19—Dist. Pub. Wks. Office, Potomac River Naval Command, Naval Gun Factory.

(Continued on page 100)



Extra Value makes the difference in Contract Bonds

AN INDEMNITY BOND covered the contractor on this lift slab dormitory built for U. S. Navy at Little Creek, Va.

INDEMNITY of North America is one of the leading independent markets for surety bonds. The extra value it gives is measured in . . . *Carrying capacity; Service* with agents and offices in principal cities of the free world; *Preferred rates* and *Prompt attention* for qualified contractors. For extra value in your bonding requirements see an INDEMNITY agent or your own broker.

One of the North America Companies which are headed by Insurance Company of North America, founded 1792

Protect what you have ©

INDEMNITY INSURANCE COMPANY OF
NORTH AMERICA
Philadelphia

BOOM LINES by VULCAN
HOW WE DOIN' ON THE SCHEDULE BOSS?
LOOKS LIKE WE'LL MAKE IT IF YOU GET THOSE PILES IN TOMORROW
WELL DON'T WORRY ABOUT THAT, BOSS, WE GOT ALL THE PILING AND YOU CAN ALWAY'S COUNT ON THE WARRINGTON-VULCAN
NO WONDER! THEY'VE BEEN MAKIN' THEM HAMMERS BEFORE WE WERE BORN! GUESS THEY OUGHT TO KNOW SOMETHING ABOUT EM'.
YOU BET THEY DO! THE WARRINGTON-VULCAN SINGLE-ACTING HAMMER IS BACKED BY 68 YEARS OF OUTSTANDING PERFORMANCE! GIVES POSITIVE ACTION THATS TROUBLE-FREE!
WRITE TODAY FOR COMPLETE DETAILS AND NAME OF NEAREST DEALER...
VULCAN IRON WORKS INC.
327 NORTH BELL AVENUE
CHICAGO 12, ILLINOIS

MORETRENCH WELLPOINT SYSTEM

Dependable Predraining That Speeds Work and Saves Money

MORETRENCH CORPORATION

Oldest, Largest, Most Experienced Predrainage Specialists

90 West St., New York 6, N. Y.

Chicago, Ill. Tampa, Fla. Houston, Tex. Rockaway, N. J.

SKOOKUM HOISTING BLOCKS

★ Stress-Proof Steel in Axle Pins.

★ At least a 5-to-1 Safety Factor on Every Skookum Block!

★ Work-Hardening, True Hadfield Manganese Steel Sheaves to Eliminate Line-Wear. Cast Steel Sheaves Specially Control-Tested.

A complete line of regular and extra-heavy patterns for every job condition.

SKOOKUM will build ANYTHING in a BLOCK or FORGING!

The SKOOKUM-CO., Inc.

8524 N. CRAWFORD, PORTLAND, OREGON • 647 TERMINAL AVE., VANCOUVER, B. C.

U.S.A. CANADA

(Continued from page 98)

Wash., D. C., repairs to paving at Navy Dpt. Service Center, Contract NBy-2627. Plans deposit $25.

Ky., Louisville—AIRPORT IMPRVS.—BA 6/20—Louisville & Jefferson County Air Bd., Standiford Field, two new wings and baggage storage area; Lee Terminal Standiford Field; $600,000; Arrasmith & Tyler, Madrid Bldg., archts.; Southern Eng. Co., 322 W. Jefferson St., engr. CD 10/15/51.

† Va., Quantico—BA 6/20—Dist. Pub. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash. D. C., impr. water supply sys., Marine Corps Schools, Contract NOy-91987. Plans deposit $55.

▲† Va., Richmond—AIR NATIONAL GUARD FACILITIES—BA 6/22—U. S. Eng., foot of Front St., Norfolk, Zone 1, Air National Guard Facilities, Type H, two 203x212 ft. hangars with shops and offices; crash truck station, motor service shop, supply and armament storage bldg., storage bldg., Byrd Field, ENG-44-110-56-33. $1,200,000. Ballou & Justice, 106 E. Cary St., archts.

† Va., Quantico—GALLEY, etc.—BA 6/26—Dist. Pub. Works Office, Potomac River Naval Command, Naval Gun Factory, Wash. D. C., 35x63 ft., 100-man mess and galley, Marine Corps Schools, NBy 2602. Plans deposit $25.

BUILDINGS—BA

† Ky., Buechel—ARMORY—BA 6/21—Dpt. Army, Ky. Natl. Guard, Frankfort, armory for Ky. National Guard, $400,000. Plans deposit $25. Nevin & Morgan, Starks Bldg., Louisville, archts. E. R. Ronald & Assoc., 954 S. 3rd St., Louisville, consult. engrs. CD 7/18.

HEAVY CONSTRUCTION—LB & CA

† Bay Constr. Co., 2808 Cromwell Rd., Norfolk, Va., LB $446,381 (6 bidders) public works facility, Naval Air Station, NOy 91374, Spec. 48244, OCEANA, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 29. CD 4/27.

† Virginia Eng. Co., Inc., 80 29th St., Newport News, Va., LB $922,000 item 1; LB $910,000 item 2 (7 bidders) 668-man barracks bldg., Naval Air Station, NOy 91325, Spec. 48263, OCEANA, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 29. CD 5/4.

▲ NORTH CAROLINA—State Hy. & P. Wks. Comm., Raleigh,

N. C.—F. D. Cline Paving Co., Box 349, Raleigh, N. C. LB $277,643, est. $250,000-$300,000. (6 bidders) grading, STBC, b. conc. binder surf. 2.46 mi. U.S. 1 from Aberdeen north to Southern Pines By-Pass, Proj. 5695, SF 232 (7). Moore Co.;

N. C.—Alamance Asphalt Paving Co., Inc., Box 391, Graham, N. C. LB $111,562, est. $100,000-$125,000. (6 bidders) c. conc. b. conc. binder surf. 0.87 mi. wid'n. U.S. 701 from point south of south city limits of Elizabethtown, north through Elizabethtown to intersection with N. C. 87, Proj. SF 255 (7), Bladen Co.;

N. C.—C. G. Tate Constr. Co., 156 N. Union St., Concord, N. C. LB $356,620, est. $300,000-$400,000. sub-grade rein., single asph. base, 9.27 mi. U.S. 17 from Grissettown, east through Shallotte to beginning of Proj. 3106, Proj. 3104, F 280 (6), Brunswick Co.; LB $220,738, est. $175,000-$200,000. (5 bidders) single asph. base, surf. or b. conc. binder surf. 14.4 mi. from point on Columbus Co. line approx. 9.6 mi. south of Bolton, south to intersection of county roads, 0.8 mi. north of Supply, Proj. 3-156, S 640 (4), Brunswick Co.;

N. C.—E. B. Towles Constr. Co., Box 1617, Wilmington, N. C. LB $592,975, est. $400,000-$500,000. sub-grade rein. CABC, b. conc. binder 7.72 mi. connection from U.S. 421 at Monkey jct. 7.5 mi. south of Wilmington N. W. via Winter Park to jct. with U.S. 17 east of Wilmington, Proj. 3595, S 868 (1), New Hanover Co.;

N. C.—Ray D. Lowder, Inc., Albemarle, N. C. LB $93,437, est. $75,000-$100,000 (8 bidders) CABC and bit. surf. tr. 3.12 mi. from point approx. 2 mi. north of Middleburg in 18 ft. BST County Rd. northeast to a point on 18 ft. BST County Rd. approx. 3 mi. northwest of Manson, Proj. 4-255, S 879 (1), Vance Co.;

N. C.—T. A. Loving & Co., Hy. 1-A North, Raleigh, N. C. LB $119,945, est. $100,000-$125,000 (5 bidders) shoulder constr., b. conc. surf. 13.22 mi. resurf. U.S. 1 from jct. with U.S. 1-A, 3 mi. south of Wake Forest to jct. U.S. 1-A 0.3 mi. north of Franklinton, Proj. 4853 SF-658 (4), Wake and Franklin Counties;

N. C.—Rea Constr. Co., Box 2015, Charlotte, N. C. LB $324,110, est. $300,000-$400,000. (7 bidders) shoulder constr., b. conc. binder surf. 16.41 mi. U.S. 70 from N. C. 49, east to a point just east of Efland and west of the Eno River Bridge, Proj. 5013 IN 644 (12), Alamance and Orange Counties; LB $281,589, est. $300,000-$400,000. (6 bidders) b. conc. binder surf. Class H and I, 23.62 mi., resurf. N. C. 18 from Shelby City limits south to South Carolina State Line, N. C. 150 from U.S. 74-A N.E. through Cherryville to beginning of 22 ft. pavement U.S. 321 from Gaston-Lincoln Co. line, N.W. to beginning of curb and gutter at south city limits of Lincolnton, Grove St. in Lincolnton, from N. C. 150 north 0.38 mi., B.C. 12-6-80-153, B.S. 12-6-81-167, B.S. 12-6-83-146, Code 5900-1206, Code 5900-1221, Cleveland, Gaston and Lincoln Counties;

N. C.—F. A. Triplett, Inc., Chester, S. C. LB $645,713. est. $400,000-$500,000. (7 bidders). SABC, bit. surf. tr., b. conc. binder surf. 1.51 mi. from west city limits of Winston-Salem, east to beginning of Proj. 7476 (part of Winston-Salem Expressway), Proj. UI-35 (6), Forsyth Co.;

(Continued on page 102)

Now! New Heavy-Duty V-8's!

With the most GO under any truck hood!

Powered to pace today's traffic!

These new 206, 226, 257 hp. V-8's in the new INTERNATIONAL V-Line have a "built-in" swift response with maximum payload. You get more *go* at lights . . . more "keep going" on the hills with shifting greatly reduced . . . higher average road speeds within legal limits . . . top performance where it's needed most.

In short, the new INTERNATIONAL V-Line is built to set new highs in your profit column!

Tested and proved as no other trucks have ever been!

Developed and tested in the lab, then put through more than 1,000,000 test-track miles, and in 2,500,000 on-the-job miles in 39 different truck vocations.

These tests were made by profit-minded truckers with a gimlet-eye on mileage, hauling time and repair bills. Their conclusions—"GREAT, on every count!"

3 Great new INTERNATIONAL V-8 engines!

	V-401	V-461	V-549
Displacement	400.9 Cu. In.	461 Cu. In.	548.7 Cu. In.
Bore and Stroke	4⅛ x 3¼	4⅛ x 4-5/16	4½ x 4-5/16
Maximum hp.	206 @ 3600	226 @ 3600	257 @ 3400
Maximum Torque	355 @ 1800-2000	420 @ 1600	505 @ 2000

Pressure Controlled-Flo Cooling! Full circulation, fully controlled. Cold weather by-pass.

"Wet" Replaceable Exhaust Valve Guides.

Exhaust Valve Faces and Seats of Stellite.

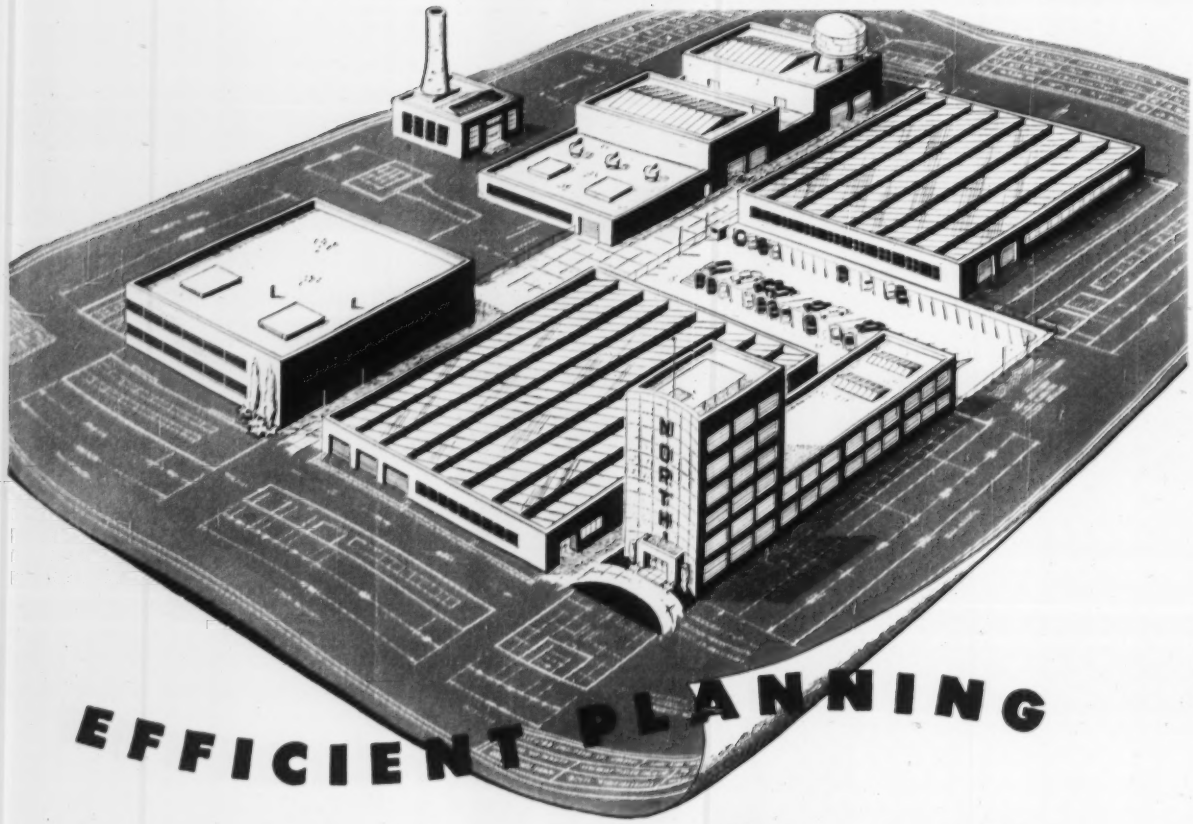
19 Pound Aluminum Flywheel Housing.

Get all the facts behind this great new truck story. Send for booklet "New Heavy-Duty V-8 Power Where You Need it Most." Write INTERNATIONAL HARVESTER COMPANY, P. O. Box 7333, Chicago 80, Illinois, or see your INTERNATIONAL Dealer or Branch.

INTERNATIONAL TRUCKS

All-Truck Built to save you the BIG money!

Motor Truck • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



EFFICIENT PLANNING

Starts with RIC·WIL

● Early planning with a RIC-WIL field representative on central heating or air conditioning systems will mean less work later on. Custom engineering and prefabrication of RIC-WIL units offer quick, efficient installation. RIC-WIL's engineering service with forty-five years experience in the Insulated Piping Field is available for *early* planning and consultation.

Write or phone your nearest representative or send for the illustrated RIC-WIL catalog.

Quality Piping Systems . . .
. . . of Exceptionally High Thermal Efficiency

RIC·WIL INCORPORATED

PREFABRICATED INSULATED PIPING SYSTEMS

BARBERTON, OHIO

(Continued from page 100)

N. C.—**Asheville Paving Co.**, Box 7068, Asheville, N. C. LB $158,338, est. $150,000-$175,000. (7 bidders) b. conc. binder surf. 16.5 mi., resurf. U.S. 19 from Wesser southwest to point 1 mi. east of Andrews, Proj. 9809, F 421 (9), B.S. 14-6-99-132, B.S. 14-6-07-139, B.S. 14-6-91-136, Swain, Macon and Cherokee Counties;

N. C.—**H. R. Stewart & Co.**, Box 88, Charlotte, N. C. LB $113,984, est. $100,000-$125,000. (7 bidders) CABC, BST 1.98 mi. from point on U.S. 64 approx. 5 mi. east of Murphy, northeast to point on Peachtree Rd. 6.5 mi. south of Marble, Proj. 0-205, S-883 (1), Cherokee Co.;

N. C.—**Barrus Constr Co.**, Box 395, Kinston, N. C. LB $78,183, est. $75,000-$100,000. (4 bidders) sheet asph. base, surf. 11.22 mi. resurf. N. C. 12 from point 0.5 mi. southeast of Lenoir-Jones Co. line southeast to west city limits of Trenton, Proj. B.S. 2-6-19-112, Jones Co.;

N. C.—**Nello L. Teer Co.**, Durham, N. C. LB $123,558, est. $125,000-$150,000. (4 bidders). CABC b. conc. binder surf. 1.64 mi. wid'n. old U.S. 15-A from end of present curb and gutter at south city limits of Raleigh, south to intersection of U.S. 15-A and U.S. 70 south of Carolina Pines, Proj. B.S. 5-7-40-84, Wake Co.;

N. C.—**Dickerson, Inc.**, Monroe, N. C. LB $82,231, est. $50,000-$75,000. (3 bidders) b. conc. binder surf. 9.1 mi., resurf. U.S. 321 from U.S. 421 in Boone, south to Bailey Camp, N.C. 18-A A sect. of West Harper Ave. in Lenoir, ramps at intersection of N.C. 18 and U.S. 321 near east city limits of Lenoir, B.S. 11-6-73-163, B.S. 11-6-75-164, Code 5900-1103, Code 5900-1104, Code 5900-1115, Caldwell and Watauga Counties. Bids May 29, CD 5/21.

† **Clarence Mobley Contg. Co.**, 640 11 St., Augusta, Ga. CA $598,766, enlisted men's club officers' club, supply storage bldg., NOy 91125, BEAUFORT, S. C. P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, S. C. CD 5/23, under LB.

▲† **Manu-Mine Research Development Co.**, Windy Hill, Angelica, Reading, Pa. CA $3,407,501, waterfront facilities, utilities, Naval Minecraft Base, NOy 94250, CHARLESTON, S. C. P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, S. C. CD. 5/16, under LB.

▲† **Porter-Wagor-Russell, Inc.**, 132 Aragon Ave., Coral Gables, Fla. LB $1,093,214, Item 1; $1,061,786, Item 2; $1,054,473, Item 3; $1,028,545, Item 4, military family housing, Naval Station, NBy 4917, Spec 4917/56, KEY WEST, FLA. P. Wks. Office, Sixth Naval Dist., Bldg. 12, Charleston, S. C. Bids May 29. CD 5/9.

▲ **Edward M. Fleming Constr. Co.**, 4121 N.W. 2 St., Miami, Fla., CA, $1,059,265, Greyhound Park, N.W. 115 and N.W. 2 and 5 Aves., MIAMI SHORES VILLAGE, FLA. Biscayne Kennel Club, Inc., 605 First Natl. Bank Bldg., Miami, Fla. Bids May 18, awarded May 25. CD 5/28, under LB.

Merritt Dredging Co., Berkeley Courts Apartments, Charleston, S. C., LB $260,000, reclaiming marsh land for campus expansion, school for Deaf and Blind, ST. AUGUSTINE, FLA. Florida State Bd. Control, Tallahassee, Fla.

▲† **McCullough Dredging Co.**, 300 S. 41 St., Birmingham, Ala., LB $1,025,450, est. $1,020,608 (only bidder) dredging channel in Apalachicola River from Gulf Intracoastal Waterway to Woodruff Dam, ALABAMA, FLORIDA and GEORGIA. U. S. Eng., 2301 Grant St., Mobile, Ala.

▲ **LOUISIANA**—Mississippi River Bridge Auth., 422 City Hall, New Orleans,

Bethlehem Steel Co., Fabricated Steel Corp., Bethlehem, Pa. CA $8,516,829, superstructure of the New Orleans and Algiers approach viaducts for Greater New Orleans Bridge. Bids May 22, awarded May 31. CD 5/25, under LB.

Lincoln Constr. Co., Stanford, Ky. LB $77,900, water lines, concrete foundations, addns., alterations water filtration plant and water mains, GREENVILLE, KY. City Utilities Comn., Greenville, Ky. Kennoy & Co., 601 S. Limestone St., Lexington, Ky., engrs. Bids May 28.

† **Harold Harwick**, Burnside, Ky., LB $124,888, est. $128,800, removal of Locks 5 and 6, water intake on Cumberland River on Old Hickory Dam reservoir, CIVENG-40-058-56-58, TENNESSEE. U. S. Eng., 306 Federal Office Bldg., Nashville, Tenn. Bids May 23. CD 4/23.

BUILDINGS—LB & CA

Cafritz Constr. Co., 1404 K St. N.W., Wash., D. C. and **Charles Tompkins**, 907 16th St. N.W., Wash., D. C., CA Est. $600,000, approx. 70,000 sq. ft. brick, cinder block WAREHOUSE, air-conditioned OFFICE, 1200 S. Eades St., ARLINGTON, VA. 1200 S. Eades St., Inc., 1404 K St. N.W., Wash., D. C. LeRoy Werner, 1404 K St. N.W., Wash., D. C., archt.

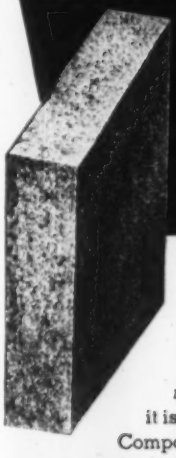
† **John W. Daniel & Co., Inc.**, River Rd., Danville, Va. CA $977,800. 11 BUILDINGS at Glass House Point, JAMESTOWN, VA. Virginia 350th Anniversary Comn., Jamestown, Va. CD 5/15, under LB.

Little Constr. Co., 1327 E. Blvd., Charlotte, N. C. CA $657,730. SCHOOL BLDG. and STAFF HOUSE, BUTNER, N. C. State Hospital Bd. Control, Capitol Bldg., Raleigh, N. C. Bids May 17. CD 6/1, under LB.

† **Boyle Constr. Co.**, Sumter, S. C. LB $816,535, constr. motor pool repair shops, paving and facilities, ENG-31-075-56-54, FORT BRAGG, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids May 16. CD 4/11.

† **L. P. Cox Co.**, Sanford, N. C. CA $504,950, 37,000 sq. ft. Murray SCHOOL, FORT BRAGG, N. C. Housing

When Concrete joints must be kept filled



Specify and Use

SERVICISED

SELF-EXPANDING CORK

1. Expands as much as 50% beyond original thickness after compression
2. Non-extruding
3. Resilient

Servicised Self-Expanding Cork Joint provides *maximum joint filling* regardless of concrete movement because it is specially treated to expand to 150% of original thickness. Composed of granulated cork and synthetic resin binder molded under heat and pressure. Widely used in tunnels, outlet works, spillways, stilling basins, sewage treatment works and water filtration works.

When joints in exposed concrete must be inconspicuous...

Specify and use Servicised

SPONGE-RUBBER CEMENTONE®

1. Blends with color of concrete
2. Fully resilient
3. Non-extruding

Servicised Sponge Rubber Cementone Joint is composed of high quality blown sponge rubber of uniform thickness and density. Gray in color, it blends with concrete to provide a fully resilient, inconspicuous joint filler. Especially suitable for bridges, viaducts, pre-cast concrete wall panels.

SERVICISED STANDARD CORK EXPANSION JOINT

Similar in composition to Self-Expanding Cork, Standard Cork Joint has a very high recovery rate after compression —95%. It is light in color and will not extrude under compression.

Write for the Servicised Catalog. It has complete details on Servicised Premolded Joint Fillers.

SERVICISED PRODUCTS CORPORATION

6051 WEST 65th STREET • CHICAGO 38, ILLINOIS

A Typical BUSY WORK DAY for WISCONSIN Air-Cooled ENGINES

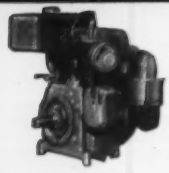
1 Working on Trench Lining Job | 2 Wisconsin-powered Mixer | 3 Wisconsin-powered tank truck pump | 4 Wisconsin-powered tank truck pump

It's a rare construction job on which you won't find one or more Wisconsin Heavy-Duty Air-Cooled Engines "giving their all" to keep the work moving on schedule, of which the above application is typical, working in a remote, dry area of the West . . . delivering top performance at lowest maintenance and operating costs.

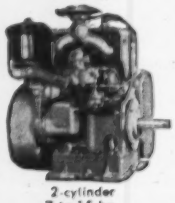
Because of their basic high torque design and heavy-duty construction, all Wisconsin Air-Cooled Engines, from the smallest to the largest, are especially suited to all forms of construction service where dependable, rugged *Lugging Power* is a "must".

Thrust-absorbing tapered roller bearings at BOTH ends of the crankshaft assure smooth running and provide greatest protection against bearing failure. All models are equipped with rotary type high tension OUTSIDE magneto, with Impulse Coupling for quick starts in any weather. A large capacity fan, integrally cast with the flywheel, maintains efficient AIR-COOLING at all temperatures up to 140° F. All models can be equipped with electric starting (starter and generator or starter only).

These are a few of the reasons why leading builders of construction equipment give the nod to Wisconsin Engines as the most satisfactory power to fit both the machine and the job. You can't do better than to specify "Wisconsin Power" for your equipment. Write for Bulletin S-188.



4-cycle single cyl., 3 to 9 hp.



2-cylinder 7 to 15 hp.

V-type 4-cyl., 15 to 36 hp.

MOST H.P. HOURS

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

A 8875-I½

DUDGEON HYDRAULIC JACKS

SALES RENTALS

• CAPACITY TO 600 TONS

FOR:
PILE TESTING
•
UNDER-PINNING
•
BRIDGES
•
PIPE PUSHING
•
SOIL TESTING

Write to Dept. E

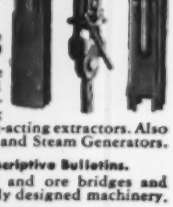
RICHARD DUDGEON INC.

709 BERGEN ST. • ST 9-4040 • BROOKLYN, N. Y.

McKIERNAN-TERRY

WIDE-RANGE LINE OF

PILE HAMMERS AND EXTRACTORS



Now made in complete standardized line of 11 double-acting hammers, 5 single-acting hammers and 2 double-acting extractors. Also Sand Drain Equipment and Steam Generators.

Write for free descriptive Bulletins.

Also builders of coal and ore bridges and unloaders, and specially designed machinery.

McKIERNAN-TERRY CORP.
32 Mercer Street, Dover, N. J.

& Home Finance Agency, 2626 "K" St. N.W., Wash. 25, D. C. CD 5/9, under LB.

† **S. J. Curry**, Albany, Ga., LB $428,370, GENERAL REPAIR SHOP annex, Marine Corps Supply Depot, NOy 91113, ALBANY, GA. P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, S. C. Bids May 24. CD 5/2.

† **Central Constr. Co.**, Decatur, Ga., LB $678,225. Naval and Marine Corps Reserve TRAINING CENTER, NOy 91111, ATLANTA, GA. P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, S. C. Bids May 23. CD 4/25.

▲ **Centex Constr. Co., Inc.**, 4606 Greenville Ave., Dallas, Tex., LB $6,353,865, est. $2,000,000-$3,000,000. construct and finance armed service HOUSING, IFB 08-603-56-572, EGLIN AIR FORCE BASE, FLA. Base Procurement Office, Eglin Air Force Base, Fla. Bids May 29. CD 4/24.

▲ **C. F. Wheeler Builder, Inc.**, 810 N. W. 72 St., Miami, Fla., LB $1,763,000. Miami Daily NEWS BLDG. between N. W. 7 St. and Miami River, MIAMI, FLA. Miami Daily News, 600 Biscayne Blvd., Miami, Fla. Bids May 22, CD 4/27.

Cecil Chandoir, P.O. Box 507, Alexandria, La. CA $938,000. JUNIOR HIGH SCHOOL, ALEXANDRIA, LA. Rapides Parish School Bd., Alexandria, La. Bids May 16, awarded May 23. CD 4/30.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Mich., Dearborn**—BA 6/21—Bd. Trustees Dearborn-Melvindale Disposal Auth., Dpt. Law, City Hall, constr. bldg. to house incinerators (4) appurtenant equip. and chimneys. $1,000,000. Plans deposit $100, refundable. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., engrs. CD 7/21.

BUILDINGS—BA

Mich., Homer—SCHOOL—BA 6/21—Bd. Educ., School Dist. No. 1 Frac., Clayton Jarrett, secy., new elementary school, addns. to high school. $450,000. Louis C. Kingscott Assoc., 511 Monroe, Kalamazoo, archts. CD 2/20.

BUILDINGS—SLC

Ill., Morris—WAREHOUSE—Morris Paper Mills, 900 E. North St., soon lets contract, 1 story, 100,000 sq. ft. brick warehouse. $800,000. Johnson & Johnson, 221 W. Washington St., Chicago, engrs. CD 3/7.

Mich., Ann Arbor—CHURCH—Zion Lutheran Church Parish, soon lets contract church. $500,000. George D. Mason & Co., 409 Griswold, Detroit, archts.

HEAVY CONSTRUCTION—LB & CA

OHIO—State Hy. Dpt., Columbus, Zone 15, rejected bids May 15, Type T-35 0.531 mi. Clark Twp. on B-119, S.R. 134, Sect. 1.93 S-77 (3), Clinton Co. CD 5/24, under LB.

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15, **The Baker & Hickey Co.**, P.O. Box 5008, Tri-Village Sta., Columbus, O. CA $1,675,243. est. $1,803,300. Type T-35 and B-70 and structures, U.S.R. 40R, Sect. 12.30, U-1085, (1), Franklin Co. CD 5/24, under LB.

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,
O.—**The Wm. L. Schloss Paving Co.**, 9521 Woodland Ave., Cleveland, O., LB $176,374, est. $171,400 (2 bidders) Type T-35, 4.114 mi. SR 306-7.96, S-46 (6) Geauga Co.;
O.—**Paul Kent, Inc.**, Box 598, Granville, O., LB $228,000, est. $252,400 (10 bidders) Type T-35 on B-11 and structures 0.793 mi. SR 229-(14.55-14.60), S-2194 (1) (Village of Gambier), Knox Co.;
O.—**The F. H. Brewer Co.**, P. O. Box 372, Lancaster, O. LB $184,527, est. $177,600, (1 bidder) Type T-35 7.724 mi. SR 158-(1.75-9.46), Village of Baltimore, City of Lancaster, Fairfield, Co.;
O.—**Boyd & Cook Co.**, 634 Third Natl. Bldg., Dayton, O. LB $326,069, est. $415,200, (2 bidders) Type T-3, 8.018 mi. SR 4-(0.00-5.85), (20.14-21.36) (22.70), City of Fairborn, City of Dayton, Village of Riverside, Greene and Montgomery Counties; LB $98,847, est. $116,876 (2 bidders) Type T-30 and T-35 17.834 mi. Clinton, Greene and Montgomery Counties;
—**Middle States Asphalt Corp.**, 15 and Front Sts., Ashland, Ky., LB $137,955, est. $151,700, (2 bidders) Type T-35 5.179 mi. USR 35-(9.54-12.64); SR 174-14.34, City of Jackson, Jackson Co.;
O.—**The Ohio Eng. Co.**, 105 6th St., Lorain, O., LB $166,507, est. $189,100, (2 bidders) Type T-35, 4.917 mi. SR 113-(6.25-6.36) Village of South Amherst, Lorain Co.;
O.—**Chapin & Chapin, Inc.**, Rte. 20, East, Norwalk, O. LB $109,142, est. $135,200, (3 bidders) Type T-35 on B-119, and structure 0.511 mi. SR 584-5.50, Ottawa Co.;
O.—**Arthur S. Langenderfer, Inc.**, 4690 W. Bancroft St., Toledo, O., LB $498,954, est. $506,000, (3 bidders) Type T-35 on B-20 and structure 3.092 mi. SR 53-5.02, Sandusky Co.;
O.—**Edgar Spring, Inc.**, Box 112, New Philadelphia, O. LB $100,501, est. $123,801, (3 bidders) Type B-35, T-35, 12.19 mi. Belmont, Guernsey and Harrison Counties;
O.—**The Clinton Asphalt Paving Co.**, 805 E. Columbus St., Wilmington, O., LB $74,895, est. $78,018, (1 bidder) Type T-35 and T-35, 12.61 mi. Clinton Co.;
O.—**Walter L. Follmer**, P. O. Box 173, Hamilton, O., LB $79,571, est. $94,385, (2 bidders) Type T-30 and T-35 17.68 mi. Montgomery and Preble Counties;
O.—**Fenton Constr. Co.**, P. O. Box 310, Ashland, O. LB $140,236, est. $74,226, Type T-30, T-31 and T-32 41.47 mi. Ashland, Medina and Wayne Counties;

(Continued on page 106)

GOFF KIRBY READY MIX COMPANY DISPATCHES TRUCKS BY RADIO, SAVES MONEY ON HAULING

Cleveland, Ohio Firm Operates 70 Trucks From Four Plants — Finds General Electric 2-Way Radio Helps Keep Costs Down!

Goff Kirby is one of Ohio's largest ready mix concrete firms. Its rolling stock is a familiar sight on construction projects throughout the Cleveland area. Last year, Goff Kirby Ready Mix Company was the only outside concrete supplier to deliver ready mix to the Ohio Turnpike project.

32 Trucks Have G-E Radio!

Nearly half the company's fleet is G-E radio equipped. These drivers are in constant contact with each of the four GK plants. Dispatch orders, changes, and special instructions by radio help make sure that loads get to a job on schedule. When breakdowns occur, the GK repair vehicle is on the scene in record time.

Radio Helps Keep Hauling Costs Down!

Edwin Harper, Goff Kirby president, reports that most of the cost of concrete is in the hauling charges. Typical rental of a concrete truck in his city is $11.50 per hour. By eliminating truck waiting time and driver overtime you save money. General Electric 2-way radio helps keep these costs down.

2-WAY MOBILE RADIO

Radio Can Help Your Operation, Too!

Goff Kirby is a typical example of progressive management in the concrete business. Your G-E Communications Counselor can tell you of others, show you how G-E Progress Line Radio can save you money. Call him in, or, write: *General Electric Company, Communication Equipment, Section X2266-11, Electronics Park, Syracuse, New York.*

Progress Is Our Most Important Product

GENERAL ELECTRIC

McGRAW-HILL BOOKS

SURVEYING

Instruments and Methods for Surveys of Limited Extent

Just Out—2nd Edit.

Describes in detail fundamentals and field practices of the most frequently used type of surveying. Gives emphasis to use of theory of errors. Covers fundamental operations, including transit, transverse, level, and leveling, and such procedures as line and grade for construction, triangulation, transit stadia and plane-table surveying, etc. Among other changes and additions in this edition are chapters on optical tooling and the elements and use of aerial photographs. **By Philip Kissam, Prof. of Civil Eng., Princeton U. 482 pp., 6 x 9, 350 illus., $5.75**

FUNDAMENTALS OF TRANSPORTATION ENGINEERING

A practical and time-saving source of design data, and planning and construction methods covering every major type of transportation engineering. Covers roads and pavements, airport engineering, railroad engineering, river and coastal engineering, pipeline transportation, and belt conveyors. Discusses specialized functions of each field separately, and gives careful attention to procedures common to many of them. **By Robert G. Hennes, Prof. of Civil Engrg., Univ. of Wash., and Martin I. Ekse, Assoc. Prof. of Civil Engrg., Univ. of Wash., 520 pp., 202 illus., $8.50**

DIESEL OPERATOR'S GUIDE

Practical guide to efficient maintenance and operation of all types of two-cycle and four-cycle diesel and dual-fuel engines used in automotive, locomotive, stationary, and marine installations. Tells how to recognize engine trouble symptoms, how to diagnose their cause, how to remedy the defect, and how to prevent its recurrence. **By C. M. Jones, 384 pp., 390 illus., $6.50**

PROFESSIONAL ENGINEER'S EXAMINATION

QUESTIONS AND ANSWERS

Over 500 questions and complete answers to help engineers pass state license examinations. Covers mechanical, electrical, civil, and chemical engineering, and includes engineering economics and land surveying. Latest questions—suitable for all states. Author has worked on New Jersey examination preparation for 19 years. By William S. LaLonde, Jr., 462 pp., 234 illus., $6.50.

10 DAYS' FREE TRIAL

McGraw-Hill Co., Inc. Dept. NR-6-14
327 W. 41st St., N. Y. C. 36

Send me book(s) checked below for 10 days' examination on approval. In 10 days I will remit for book(s) I keep, plus few cents for delivery costs, and return unwanted book(s) postpaid. (We pay delivery costs if you remit with this coupon—same return privilege.)

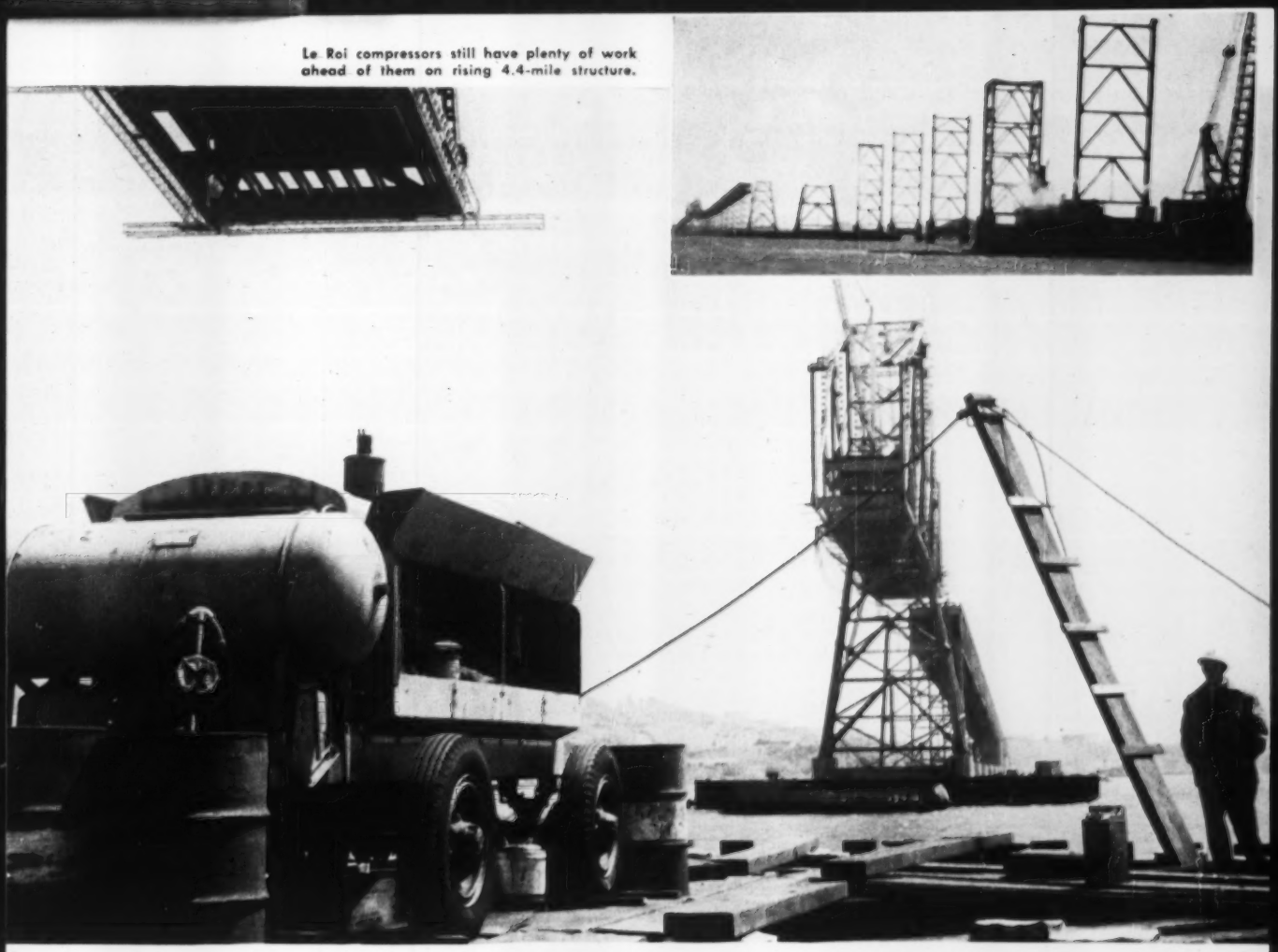
☐ Kissam—**Surveying**, $5.75
☐ Hennes & Ekse—**Fund. of Trans. Engg.**, $8.50
☐ Jones—**Diesel Operator's Guide**, $6.50
☐ LaLonde—**P. E. Exam. Ques. & Ans.**, $6.50

(PRINT)
Name .....
Address .....
City ..... Zone .... State .....
Company .....
Position .....
For price and terms outside U. S. Write McGraw-Hill Int'l., N. Y. C. NR 6-14

(Continued from page 104)

O.—**The Shelly Co.**, Thornville, O., LB $88,030, est. $97,578, (5 bidders) Type T-30, T-31, T-31 39.23 mi. Athens, Morgan and Washington Counties;
O.—**L. P. Cavett Co.**, 511 Shepherd Ave., Lockland,, O., LB $108,975, est. $123,632, (3 bidders) Type T-30 and T-32 22.98 mi. Highland Co.; LB $108,713, est. $115,298 (5 bidders) Type T-30, T-32 14.33 mi. Lawrence Co. Bids May 29. CD 5/2.
Lombardo Bros. Constr. Co., 3600 Ridge Rd., Cleveland 2, O. LB $857,373, est. $813,000, (1 bidder) wid'n. Snow Rd. from Pearl to W. 130 Sts. and W. 130 St. from 600 ft. south of Snow Rd. to 600 ft. north of Hummel Rd., Parma, CLEVELAND, O. Comrs. Cuyahoga Co., Court House, Cleveland 13, O. Bids May 28. CD 5/10.
▲ **Schirmer-Peterson Co.**, 6830 Beaver Ave., Cleveland 4, O., LB 953,135, est. $650,000, (2 bidders) recreation center, E. 82 St. and Lucia Ave., CLEVELAND, O. City, Dpt. P. Properties, John J. Lucocco, dir., City Hall, Cleveland 14, O. Bids May 24. CD 5/4.
R. S. Ursprung Co., Hanna Bldg. Annex, Cleveland 15, O., LB $929,108, est. $650,000, (2 bidders) recreation center, Fulton Rd. and Shadyside Ave. (Cleveland, O.)
Asphalt Products Co., Viking Lane, Dayton, O. CA $75,-665. Siebenthaler Ave. from Phila. Dr. to Catalpa Dr., Harrison Twp.; Springbrook Pike from Broadway Bridge to State Rte. 25, Moraine Twp.; Siebenthaler Ave. from Corp. Line to North Dixie Dr., Harrison Twp.; Ridge Ave. from Corp. Line to North Dixie Dr., Harrison Twp.; Nicholas Rd. from Corp. Line to Corp. Line Harrison, Twp., DAYTON, O. Comrs. Montgomery Co., Court House, Dayton, O. Bids May 15. CD 5/2.
† **Livesy Co.**, 273 Whitehford Ave., Atlanta, Ga. LB $477,000, est. $525,000. heating plant, Wood City area Wright Patterson Air Force Base, DAYTON, O. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids May 29. CD 4/24.
Antennan Constr. Co., Hamilton, O. LB $123,162. (6 bidders) swimming pool, bath house, HAMILTON, O. City, Municipal Bldg., Hamilton, O. Bids May 25. CD 5/1.
▲ **ILLINOIS**—State Div. Hys., Centennial Bldg., Springfield.
Ill.—**Stupp Bros. Bridge & Iron Co.**, 3800 Weber Rd., St. Louis, Mo. LB $542,195. (4 bidders) furnishing steel for tow 8-span steel girder separation structures 1 mi. S.E. of Belleville St. Clair Co.;
Ill.—**Vierling Steel Works**, 53 W. Jackson St., Chicago, Ill. LB $149,846. (4 bidders) structural steel for two 5-span railroad grade separations in Berkeley, Du Page and Cook Counties;
Ill.—**Wendnagel & Co., Inc.**, 600 W. Cermak St., Chicago, Ill. LB $124,044. (6 bidders) structural steel for 2 railroad grade separation, F.A. Rte. 6, Du Page and Cook Counties;
Ill.—**Eric Bolander Constr. Co.**, Libertyville, Ill. LB $83,962. (7 bidders) 2 bridges Rte. 154, between La Salle and Ottawa, La Salle Co.;
Ill.—**Bennett Industries, Inc.**, Peotome, Ill. LB $105,-335. (6 bidders) furnishing steel for 3 grade separations. Elmhurst, DuPage Co. Bids May 29. CD 5/17.
▲ **ILLINOIS**—State Div. Hys., Springfield.
Ill.—**Leon B. Steeley Constr. Co.**, Marion, Ill. LB $119,-424. (3 bidders) surf. 3.25 mi. from FAS 887 south of Epworth east to Maurice, White Co.; LB $306,-563. (5 bidders) conc. 0.62 mi. wid'n. 1.49 mi. S.B.I. Route 1, Williamson and Johnson Counties;
Ill.—**Princeville Stone Co.**, Princeville, Ill. LB $80,975. (5 bidders) grav. course 3.58 mi. from Cambridge north and west FAS 1230, Henry Co.; LB $84,512. grav. base 6.15 mi. north and east of Galva, FAS Rt. 229, Henry Co.;
Ill.—**Barthelmey & Lawrence**, Casey, Ill. LB $167,297. (3 bidders) bit. surf. 4.14 mi. FAS Rt. 702, Cumberland Co.; LB $273,552 (4 bidders) bit. surf. 8.7 mi. FAS Rte. 688, Clark Co.;
Ill.—**Litchfield Bit. Corp.**, Hillsboro, Ill. LB $79,921. 4.49 mi. FAS Rte. 728, Macoupin Co.; LB $118,751. (2 bidders) wid'n. 4.25 mi. FAS Rte. 728, Macoupin Co.;
Ill.—**Peter Baker & Son**, Lake Bluff, Ill. LB $76,784. (2 bidders) resurf. 3.9 mi. Rte. 120, Lake Co.;
Ill.—**J. P. Wetherby Constr. Co.** Ottawa, Ill. LB $391,-493. (4 bidders) b. conc. resurf. 17.21 mi. U. S. Rte. 52, La Salle Co.;
Ill.—**J. D. Barter Co.**, Harrisburg and **E. T. Simonds Co.**, Carbondale, Ill. LB $290,814. (3 bidders) c. conc. 1.78 mi. Madison Co.;
Ill.—**Berenz & Son Asphalt Co.**, Bloomington, Ill. LB $208,164. (1 bidder) District 3 patching and resurf. Rte. 9, McLean Co.;
Ill.—**Suburban Oil Co.**, Forest Park, Ill. LB $135,802 (3 bidders) resurf. 8.57 mi. Kane and McHenry Counties;
Ill.—**Gunther Constr. Co.**, Galeburg, Ill. LB $146,436. (2 bidders) surf. 6.08 mi. FAS Rte. 399, Knox Co.;
Ill.—**Gilmore Asphalt Products, Inc.**, Anna, Ill. LB $209,219 (3 bidders) bit. conc. resurf. 13.96 mi. Dist. 9, Johnson, Pulaski and Union Counties;
Ill.—**Gem Contracting & Paving**, Quincy, Ill. LB $194,-136. (1 bidder) b. conc. resurf. 3.53 mi. Ill. Rte. 9, Hancock, McDonough and Fulton Counties;
Ill.—**Burlington Roadbuilders, Inc.**, Carthage, Ill., LB $78,241 (3 bidders) grav. course 1.89 mi. FAS Rte. 421, Hancock Co.;
Ill.—**Champaign Asphalt Co.**, Champaign, Ill., LB $247,-583 (2 bidders) bit. conc. resurf. 9.943 mi. S.B.I. Rte. 9, Ford and Vermilion Counties;
Ill.—**Gallagher Asphalt Co.**, Thornton, Ill., LB $205,-601 (4 bidders) 1.78 mi. Rte. 121 Chicago, Cook Co.;
Ill.—**McCalman Constr. Co.**, Danville, Ill., LB $345,130 (2 bidder) c. conc. 2.99 mi. FAS Rtes. 513 and 514, Vermilion Co.;
Ill.—**Dale Denny Constr.**, Anna, Ill., LB $108,116 (6 bidders) bit. surf. 4.54 mi. FAS 895, Saline Co.;
Ill.—**R. A. Cullinan & Son, Inc.**, Tremont, Ill., LB $256,937 (1 bidder) resurf. 5.94 mi. SBI Rte. 9, Tazewell Co.;
Ill.—**Rein & Schultz, Inc.**, 119 E. Washington Ave., Madison, Wis., LB $173,966 (4 bidders) conc. resurf. 9.5 mi. Distr. 2, Jo Daviess, Carroll and Stephenson Counties;
Ill.—**Giertz-Melahn Asphalt Co.**, Elgin, Ill., LB $113,-461 (3 bidders) resurf. 7.34 mi. Kane Co.;
Ill.—**Rockford Black Top Constr. Co.**, 1615 Westchester Rd., Rockford, Ill., LB $218,175 (2 bidders) bit. resurf. Dist. 2, Lee and Ogle, Carroll Counties;
Ill.—**Geneva Constr. Co.**, Aurora, Ill., LB $334,856 (4 bidders) resurf. 21.08 mi. Rte. 23, La Salle and DeKalb Counties;
Ill.—**G. S. Chastain**, Decatur, Ill., LB $313,415 (6 bidders) bit. surf. 10.8 mi. Shelb Co.;
Ill.—**McDougal-Hartman Co.**, 3101 N. Adams St., Peoria, Ill., LB $316,581 (5 bidders) c. conc. base 9.19 mi. SBI Rte. 9, Ford and Vermilion Counties;
Ill.—**Clark Bros. Co.**, 309 S. Jefferson Ave., Peoria, Ill. LB $554,429 (5 bidders) paving 6.53 mi. SBI Rte. 6, Lee and Ogle Counties;
Ill.—**Wood Electric Constr. Co.**, 2326 W. Ogden St., Chicago, Ill., LB $89,928. traffic signals Dist. 10, near Chicago, Cook Co.;
Ill.—**White Constr. Co.**, 1735 W. Fullerton St., Chicago, Ill., LB $169,944 (5 bidders) b. conc. resurf. 2.72 mi. SBI Rte. 54, Cook Co.;
Ill.—**Standard Paving Co.**, 308 W. Washington St., Chicago, Ill., LB $73,650 (5 bidders) resurf. 0.66 mi. Rte. SBI 55, Chicago, Cook Co.;
Ill.—**Seneca Petroleum Co.**, 3258 S. Canal St., Chicago, Ill., LB $286,998 (1 bidder) c conc. patching and resurf. 14.93 mi. District 4, Henry, Stark,, Peoria and Marshall Counties;
Ill.—**Robert A. Black, Inc.**, 13912 Halsted St., Riverdale, Ill., LB $747,591 (7 bidders) wid'n. 14.57 mi. c. conc. base 2.37 mi. SBI Rte. 69 and 23, La Salle Co. Bids May 29. CD 5/17.
ILLINOIS—State Div. Hys., Springfield,
McCalman Constr. Co., 619 Secton St., Danville, Ill., CA, $594,470, resurf. 10.07 mi. U. S. Route 50, Vermilion Co. Bids Apr. 24. CD 4/27, under LB.
▲ **S. H. Healy Co.**, 20 N. Wacker Dr., Chicago, Ill., LB $7,852,050, tunnel from South side filtration plant to 79 and State Sts. connecting with State St. tunnel to Roseland pumping station, CHICAGO, ILL. City, City Hall, Chicago, Ill. CD 1/30/51
▲ **MICHIGAN**—Mackinac Bridge Auth., 698 Prudden Bldg., Lansing,
rejected bids May 15, 17,918 ft. paving of deck of New Mackinac Bridge, St. Ignace-Mackinac City. CD 6/1, under A.
▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
Mich.—**A & A Asphalt Paving Co.**, 1045 Haynes St., Birmingham, Mich. CA $519,132, est. $540,000. b. conc. surf., base course wid'n. paving 10.623 mi. on US-10, M, M 63-3 C20 U M 63-3 C12-R, etc., Oakland Co.;
Mich.—**H. J. Brighton**, Farmington, Mich. CA $609,-262, est. $620,000. c. conc. 0.893 mi. on east and west service roads, ramps, F 82-36, etc., Wayne Co.;
Mich.—**Wright Constr. Co.**, 3800 Wood St., Lansing, Mich. CA $504,860, est. $530,000. b. conc. 6.468 mi. M-50, aggregate base course 6.524 mi. on M-50, F 23-10, etc., Eaton Co. Grand total $1,633,254. CD 5/16, under LB.
MICHIGAN—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
rejected bids May 23, aggregate base course, b. conc. 14.433 mi. US-131, F 5-17 C7-R (F 102 4), F 5-17 C5-R, F 5-17 C6-R (F 166 9), M 4-17 C8-U, Antrim Co. New bids June 6. CD 5/9.
▲ **MICHIGAN**—State Hy. Dpt., Escanaba,
Mich.—**Louis Garavaglia**, 24240 Mount St., Center Line, Mich. and **Pierson Contg. Co.**, 200 Eddy Bldg., Saginaw, Mich. CA $1,036,473, est. $1,000,000. c. conc. wid'n., curb and gutter, 7.982 mi. F 52-33 C9-U (F 137 18), etc., Marquette Co.;
Mich.—**Bacco Constr. Co.**, Iron Mountain, Mich. CA $758,230, est. $800,000. aggregate base course prime and double seal 9.106 mi. M-33, SS 21-13 C3-R (S 854 1), Delta Co. CD 5/16, under LB.
† **A. J. Etkin Constr. Co.**, 1011 Capital St., Oak Park, Mich. CA $134,353. tactical supporting facilities, vicinity of Wyandotte, MICHIGAN. U. S. Eng., 600 E. Jefferson Ave., Detroit 26, Mich. Grand total $414,-459. Bids May 15. CD 5/4;
Forrester Constr. Co., 600 Sill Bldg., Flint, Mich. CA $139,994. tactical supporting facilities, Mount Clemens (Michigan);
J. A. Fredman Co., 735 S. Paddock St., Pontiac, Mich. CA $140,112. tactical supporting facilities, Pontiac (Michigan).
Ann Arbor Constr. Co., 221 Felch St., Ann Arbor, Mich. CA $165,413. wid'n., surf. Fletcher, Washington and South State Sts., ANN ARBOR, MICH. City, Fred J. Leeker, city clk., Ann Arbor, Mich. Bids May 16. CD 5/11.
Walbridge-Aldinger Co., 409 Griswold St., Detroit, Mich. LB $317,233. indoor, outdoor swimming pool, for SENIOR HIGH SCHOOL, Lincoln and Chanbrook Sts., BIRMINGHAM, MICH. City, School Dist., Ames F. Gregory, secy., Chester and Martin Sts., Birmingham, Mich. Bids May 15. CD 4/26.
▲ **Halloway Constr. Co.**, Livonia, Mich. LB $1,850,984. Ashcroft-Sherwood-Livonia drains, relocate and re-tile, DETROIT, MICH. Comr. Wayne Co., 2523 Cadillac Tower, Detroit 26, Mich. Bids May 11. CD 4/27.
▲† **Joseph A. Bass Co.**, Sexton Bldg., Minneapolis, Minn. CA $1,049,000. ordnance storage facilities, K. I. Sawyer Air Force Base, MARQUETTE, MICH. U. S. Eng., 600 E. Jefferson Ave., Detroit, 26, Mich.
▲† **A. J. Etkin Constr. Co.**, 10111 Capital, Oak Park, Mich. CA $1,226,113. ordnance storage facilities,

(Continued on page 108)



Le Roi compressors still have plenty of work ahead of them on rising 4.4-mile structure.

Sea-Going Air Power Helps Assemble 4.4-mile Bridge

Air compressors are located at hard-to-get-at pilings

Some working more than two miles from land

Nearly a dozen Le Roi Airmaster compressors provide dependable power for air tools to speed steel assembly

Choppy waves and swirling currents tug at the pilings that support nearly a dozen Le Roi compressors. Gusty winds howl through the steel work high above the whitecaps. Yet progress is unhampered on the new $62 million 4.4-mile bridge across San Francisco Bay.

Dependability and easy starting of prime importance. The 600-cfm Le Roi compressors placed out in the bay provide air power for air tools used on steel assembly work along the 21,343-foot span. It's difficult to reach these units for servicing — yet reliable, uninterrupted performance is essential. That's why Le Roi compressors were selected. Exposed to driving, moisture-laden winds and piercing salt spray, these easy-starting, trouble-free air compressors keep plenty of air power moving through the hose. Further proof of the popularity of Le Roi compressors in the "Bay" area is found in the fact that Clementina Ltd. uses a fleet of 120 Le Roi's for rental purposes.

A new method of handling long trusses was developed. Because of the high winds and tricky tidal currents, a set of 280-foot aluminum-alloy supporting spans was built which allowed on-site erection of the permanent steel spans.

Second largest bridge. Contractors on this new bridge to link Richmond and San Rafael, California are Judson Pacific, Murphy, Kiewit. The huge 4.4-mile span is surpassed only by the famed San Francisco Bay Bridge. Highest tower on this new structure rises 325 feet above the water.

Use Le Roi air power on all your jobs for reliable performance under all conditions. See your Le Roi distributor today.

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

Imperial

the world's finest

TRACING CLOTH

In drafting rooms throughout the world Imperial quality is the standard by which fine tracing cloths are judged. This has been true for decades, and Imperial remains the finest tracing cloth because its makers have continued to improve its quality and value.

Tho'

CAKED WITH CONCRETE

this phone never failed

Moving with the job as it progressed, this phone was one of a series used by the S. A. Healy Company on the Bowery Bay Sewerage Disposal job, almost five miles long.

Being subjected to such hardships is nothing new for HOSE-McCANN Sound Powered Telephones for they are made to operate just about everywhere with the same dependable service . . . under normal conditions or in any emergency.

NEED NO CURRENT Activated by the sound energy of the voice, these phones operate at all times without batteries or other outside sources of current. For permanent installation on industrial projects or for temporary use on construction jobs, HOSE-McCANN Phones offer trouble-free performance with a minimum of upkeep.

INDOOR OR OUTDOOR MODELS Available in selective or common ringing and semi-selective or common talking.

Write for illustrated catalog

HOSE-McCANN TELEPHONE CO., INC.
761 THIRD AVENUE
BROOKLYN 32, N. Y.

(Continued from page 106)

Wurtsmith Air Force Base, OSCODA, MICH. U. S. Eng., 600 E. Jefferson Ave., Detroit 26, Mich. Bids May 18. CD 5/4.

BUILDINGS—LB & CA

Albert M. Higley Co., 2036 E. 22 St., Cleveland 15, O. CA Est. $210,000. 30,000 sq. ft. brick, concrete PLANT, Aurora Rd., SOLON, O. Trabon Eng. Co., 1814 E. 40 St., Cleveland 3, O. Awarded Apr. 11. CD 11/11.

▲ **B & B Constr. Co.**, 1616 Covington St., Youngstown, O. CA Est. $1,250,000, SHOPPING CENTER, fronting 1,149 ft. on Lincoln Knolls Plaza, McCartney Rd., YOUNGSTOWN, O. Grant-Halladay Constr. Co., Callahan Bldg., Dayton, O.

▲ **Modern Age Homes, Inc.**, 426 Knox St., Gary, Ind. Own Forces, $1,225,000. 65 HOMES, GARY, IND. David Katz, 355 Arthur St., Gary, Ind., archt.

▲ **L. J. Coombs & Sons**, 2645 Wabash St., Gary, Ind., Own Forces, $1,500,000. 60 HOMES, Marquette Manor, GARY, IND. CD 2/30/53.

▲ **Republic Homes Corp.**, 8000 Juniper St., Gary, Ind., Own Forces, $6,000,000, 320 HOMES, Miller Area 8100 block on Locust Indian Boundry and Juniper Sts. near GARY, IND.

▲ **Norm Casner & Assocs.**, 619 S. Wisconsin St., Hobart, Ind., Own Forces, $1,000,000, 80 HOMES, HOBART, IND.

I. Bush & Sons, S. Brook St., Louisville, Ky., LB $579,777, (7 bidders) CHURCH, Charlestown Rd., NEW ALBANY, IND. Trinity Methodist Church, 1214 Spring St., New Albany, Ind. Harold E. Wagoner, Architects Bldg., 117-17th St., Phila., Pa., archt. Bids May 29. CD 5/11, under LB.

Garr Builders, Inc., 4727 N. Monticello Ave., Chicago, Ill., LB $450,000. Old Main SCHOOL addn. BLUE ISLAND, ILL. School Dist. 218, 12700 S. Sacramento Ave., Blue Island, Ill.; Nicol & Nicol, 23 E. Jackson Blvd., Chicago, Ill., archts.

S. N. Nielsen Co., 3059 W. Augusta Blvd., Chicago, Ill., CA, $700,000. 1 story, brick, 70,000 sq. ft. FACTORY and OFFICE, 9301 W. King St., FRANKLIN PARK, ILL. Superior Concrete Accessories, Inc., 4249 W. Diversey St., Chicago, Ill. Bruce A. Gordon Co., 1 N. La Salle St., Chicago 2, Ill., archt.

▲† **Tunnicuiff Construction Co. and MacDonald Constr. Co.**, P. O. Box 177, Davenport, Iowa, LB $1,558,000, gross base bid (6 bidders) POST OFFICE and COURT HOUSE under Lease Purchase Plan, ROCK ISLAND, ILL. General Service Admin. Regional Office, 219 Clark St., Chicago 4, Ill. Bids May 29. CD 4/19.

Meredith Bros. Co., 939 S. 2 St., Milwaukee, Wis., CA, $750,000. 1 story, 100x650 ft., and 85x96 ft. WAREHOUSE-OFFICE, MILWAUKEE, WIS. Central Steel & Wire Co., 6623 W. Mitchell St., Milwaukee, Wis. Bids May 8. CD 4/25.

▲ **Hunzinger Constr. Co.**, 4577 N. 124 St., Milwaukee, Wis., CA, $1,200,000. 225x327 ft. and 55x121 ft. factory and office addn. MILWAUKEE, WIS. Cutler-Hammer, Inc., 4255 N. 30 St., Milwaukee, Wis. CD 3/8.

A. E. Nack Constr. Co., 1430 S. 16 St., Sheboygan, Wis., CA, $100,000. 1 story, 100x120 ft., block WAREHOUSE, SHEBOYGAN, WIS. General Box Co., 1560 N. 17 St., Sheboygan, Wis. Satre & Senescall, 707 Center Ave., Sheboygan, Wis., archts.

▲ **Spence Brothers**, 417 McCoskry St., Saginaw, Mich. CA general constr. 3 story HOSPITAL wing addn., ALPENA, MICH. Total est. $1,095,000. Alpena Hospital Bd. Trustees, Alpena, Mich. Bids Feb. 28. CD 1/26;
Dietel Heating Co., 1120 Sheridan St., Lansing, Mich. CA mechanical work. (Alpena, Mich.);
Hateld Electric Co., Inc., Marquette, Mich. CA electrical work. (Alpena, Mich.).

▲ **Sorensen-Gross Constr. Co.**, Flint, Mich. LB general constr. MUNICIPAL CENTER, incl. City Hall, auditorium, police headquarters, courts, public health, etc., FLINT, MICH. Total est. $4,624,304. City, Harry K. Cull, city clk., Flint, Mich. Bids May 14, CD 4/20;
DeVanay Plumbing & Heating Co., Flint, Mich. LB mechanical work (Flint, Mich.);
Batzil Electric Co., Inc., Flint, Mich. LB electric work. (Flint, Mich.)

▲ **Charles N. Board**, 22427 Gratiot St., Detroit, Mich. CA Est. $1,300,000. high SCHOOL, FRASER, MICH. Village, Fraser School Dist., Fraser, Mich. Bids May 14. CD 5/1.

▲ **Owen Ames Kimball Co.**, 38 Pearl St. N. W., Grand Rapids, Mich. CA Est. $1,500,000. 240x560 ft. PLANT, Burlingame Ave. S. W., GRAND RAPIDS, MICH. Diesel Equip. Div., General Motors Corp., General Motors Bldg., Detroit, Mich. CD 4/12.

Alfred A. Smith, 721 E. Saratoga St., Ferndale 20, Mich. LB $695,350. general constr. JUNIOR HIGH SCHOOL, SOUTHFIELD, MICH. Southfield Twp., Mark W. Rebine, secy. Pub. Schools, 245 Lafiser St., Detroit 19, Mich. Bids May 16. CD 4/18.

Spence Bros., 417 McCoskry St., Saginaw, Mich. LB $421,400. general constr. HOSPITAL, GRAYLING, MICH. Sisters of Mercy Hospital, Grayling, Mich. Bids May 9. CD 5/3.

Palmer Smith Co., 415 Brainard St., Detroit 1, Mich. CA $954,760. general constr. JUNIOR HIGH SCHOOL, PLYMOUTH, MICH. City, Bd. Educ., Plymouth, Mich. CD 5/25, under LB.

▲ **O. W. Burke Co.**, 1032 Fisher Bldg., Detroit 2, Mich. CA Est. $1,200,000. 7 story, masonry OFFICE, Eight-Mile Rd. west of Northwestern, SOUTHFIELD, MICH. R. H. McManus & Co., 16100 W. 8 Mile Rd., Detroit, Mich. CD 5/9.

(Continued on page 111)

New Prudential Buildings' Ceilings Feature

Acousti-Celotex Tile Installations for Completely Flexible Integrated Systems

Office in Jacksonville Prudential Building, showing typical Acousti-Celotex Sound Conditioning installation

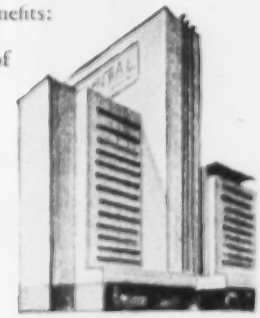
Prudential's South Central Home Office
Jacksonville, Florida
General Contractor: Daniel Construction Co.
Architects: Kemp, Bunch & Jackson

Included in the Acousti-Celotex Sound Conditioning installations of the beautiful and nationally-acclaimed Prudential Buildings . . . were more than 1,000,000 square feet of incombustible Acousti-Celotex Perforated Mineral Tile, Celotone® Tile, and Acousteel® metal pan. The Acousti-Line® Suspension System, on which Acousti-Celotex Tile was installed, offers two additional functional benefits: Complete flexibility of ceiling units . . . tile, lights, air diffusers, etc. . . . permits interchanging for unlimited variety of office layouts and arrangements. And easy access is provided to above-ceiling areas for servicing of lights, wires, ducts, plumbing, other utilities.

Prudential's North Central Home Office,
Minneapolis, Minnesota
General Contractor: Haglin and Sons Co.
Architects: Magney, Tusler & Setter

Here's One Contract You Simply "Let and Forget!"

Sound Conditioning was supplied by three different Acousti-Celotex distributing organizations, working with three general contracting companies and three architectural firms. 30 years of sound engineering experience makes the Acousti-Celotex distributing organization invaluable to the general contractor. When you award a sub-contract to your Acousti-Celotex distributor, you may be sure you can "let it and forget it." On any acoustical problem whatever . . . contact your Acousti-Celotex contractor.



Prudential's Southwestern Home Office, Houston, Texas
General Contractor: W. S. Bellows Construction Corp.
Architect: Kenneth Franzheim

TRADE MARK

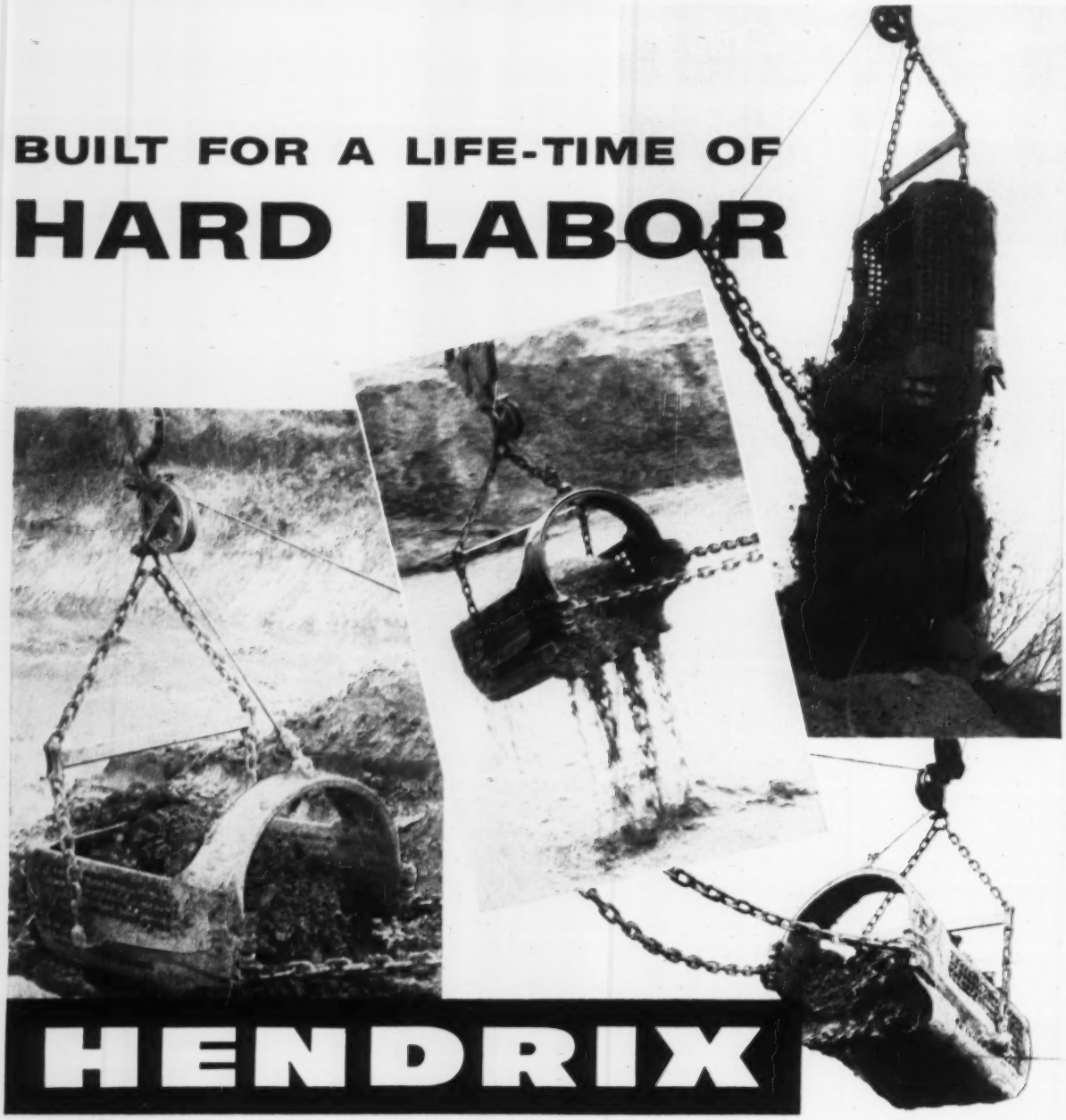
ACOUSTI-CELOTEX
REGISTERED U. S. PAT. OFF.

Sound Conditioning

Products for Every Sound Conditioning Problem—The Celotex Corporation, 120 S. LaSalle St., Chicago 3, Illinois • **In Canada:** Dominion Sound Equipments, Ltd., Montreal, Quebec.

BUILT FOR A LIFE-TIME OF

HARD LABOR



HENDRIX

DRAGLINE BUCKETS

A TYPE FOR EVERY DIGGING PURPOSE

¼ to 40 Cubic Yards

All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

Hendrix Lightweight Dragline Buckets

(Continued from page 108)

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† New Mexico—BA 6/27—U. S. Eng., Box 1538, Albuquerque, Abiquiu Flood Control Dam Outlet 12 ft. dia., 2,300 ft. long, concrete lined tunnel, etc., Rio Chama, CIVENG-29-005-56-17. $1,000,000-$5,000,000. CD 5/16.

BUILDINGS—BA

▲† N. M., Los Alamos—HOUSING—BA 6/28—Atomic Energy Comn., Los Alamos Area Office, Los Alamos, Group 18 housing, Phase B, 100 dwelling units, $1,200,000-$1,500,000.

BUILDINGS—SLC

N. D., Dickinson—HOME—St. Luke's Home, Bd. Trustees, J. Amundson, chn., Dickinson, soon lets contract home $344,000. Foss & Co., Moorhead, Minn., archts. CD 1/6.

N. D., Minot—BANK, etc.—American State Bank, 1st and 1st Ave. N.W., soon lets contract bank and office bldg. $500,000. J. V. De Loi & Assoc., Minot, archts. CD 12/1.

HEAVY CONSTRUCTION—LB & CA

Phelps Drake Co., 1415 S.E. Eighth St., Minneapolis, Minn. CA $211,000 (5 bidders) constr. water mains, sanitary lateral sewers, EDINA, MINN. Village Village, Gretchen S. Alden, clk., Edina, Minn. Bids May 26. CD 3/4/55.

J. W. Craig Co., 1814 N.E. California St., Minneapolis, Minn. LB $103,330 (2 bidders) constr. grade, subbase grav. base, road-mixed bit. surf. 6.4 mi. between SAR 19 at Loretto and W. line of county, MINNEAPOLIS, MINN. Hennepin Co., R. F. Fitzsimmons, aud., Minneapolis, Minn. Bids May 29. CD 5/10.

E. J. Pennig Co., 475 Minnehaha Ave. W., St. Paul, Minn. LB $247,000 (5 bidders) pave Selby Ave., ST. PAUL, MINN. City, L. E. Kinvig, city purch. agt., 253 City Hall, St. Paul, Minn. Bids May 29. CD 5/25.

Everds Bros., Algona, Iowa, and Hodgman & Sons, Inc., Fairmont, Minn., CA $435,398, b. conc. paving county roads, ALGONA, IOWA. Bd. Supervs. Kossuth Co. Court House, Algona, Iowa. Bids May 1. H. M. Smith, c/o owner, co. engr.

† Costa Co., Inc., 315 WOW Bldg., Omaha, Neb. LB $381,751, construct, repair standard and rock fill dikes and revetment, Missouri River Aspinall-Rulo Bends, near Corning, Iowa., Inc. 25-066-56-141, MISSOURI and NEBRASKA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids May 25. CD 5/16.

▲ MISSOURI—State Hy. Dpt., Jefferson City,

Mo.—Mary Constr. Co., Cape Girardeau, Mo. LB $217,501 (6 bidders) one 127 ft. rein.-con. deck girder spans Sta. 1017 plus 47, St. Louis Co.;

Mo.—Fruin Colnon Contg. Co., 1706 Olive St., St. Louis 3, Mo. LB $574,252 (6 bidders) two 20 ft. rigid frame box Sta. 987 plus 15, St. Louis Co.; LB $134,803. (2 bidders) three 54 ft. continuous slab spans Sta. 172 plus 68, St. Louis Co.; LB $292,210. (6 bidders) two 57 ft., one 95 ft., continuous concrete box girder spans Sta. 983 plus 95, St. Louis Co.; LB $179,658. (6 bidders) two 48 ft., one 64 ft., continuous concrete deck girder spans Sta. 1007 plus 47, St. Louis Co.;

Mo.—W. J. Menefee Constr. Co., 419 W. Main St., Sedalia, Mo. LB $194,531. (8 bidders) 47 ft., two 75 ft., one 90 ft. continuous one 41 ft. I beam spans Sta. 338 plus 95, St. Francois Co. Bids May 24. CD 5/11.

▲ MISSOURI—State Hy. Dpt., Jefferson City,

Mo.—Bridges Paving Co., 411 Central Industrial Dr., St. Louis 10, Mo. LB $91,594. (3 bidders) b. conc. 1.92 mi., city of St. Louis;

Mo.—Orco Contg. Co., Inc., 310 S. Fillmore St., Kirkwood, Mo. LB $282,614. (2 bidders) wid'n., 5 conc. 2.828 mi. Scott Co.;

Mo.—Midwest Precote Co., 7600 E. 17 St., Kansas City, Mo. LB $454,986. (6 bidders) wid'n., b. conc. 14.872 mi., Cass Co.;

Mo.—Davis Constr. Co., Inc., Sixth and Spring Sts., Boonville, Mo. LB $97,665. (10 bidders) grav. or crushed stone surf. 12.5 mi. Audrain Co.;

Mo.—J. F. Culp Constr. Co., P. O. Box 262, Maryville, Mo. LB $77,887. (7 bidders) oiled earth surf. 8.028 mi. Atchison Co.;

Mo.—St. Louis Co. Bridge & Grading Co., 7929 Alabama Ave., St. Louis, Mo. LB $82,575 (2 bidders) c. conc. 0.222 mi. St. Louis Co.; LB $1,423,282. (2 bidders) c. conc. St. Louis Co.;

Mo.—Clarkson Constr. Co. & Cameron Joyce Co., 4133 Gardner Ave., Kansas City, Mo. LB $1,355,505. (8 bidders) c. conc. 7.502 mi. St. Francois Co.;

Mo.—Runquist Co., Savannah, Mo. LB $73,408. (6 bidders) grav. or crushed stone surf. 4.493 mi. Andrew Co.;

Mo.—Millstone Constr. Inc. & Fred Weber Contg., Inc., 7929 Alabama Ave., St. Louis, Mo. LB $836,175. (6 bidders) graded earth, retaining wall, grade separation, c. conc. 1.049 mi. St. Louis Co. Bids May 24. CD 5/11.

John H. Parkinson, Camdenton, Mo. CA $145,000. sewage treatment plant, auxiliaries, appurtenances, connecting sewer, BELTON, MO. City, J. Weldon Jackson, clk., Belton, Mo. Bids May 18. CD 5/10.

▲ NORTH DAKOTA—State Hy. Dpt., Bismarck,

N. D.—Gust Strom & Sons, Moorhead, Minn. LB $126,760. tr. serv. grav. 7.936 mi., Proj. F 4 (8), Richland Co.;

N. D.—W. Hodgman & Sons, Inc., Fairmont, Minn. LB $286,427. base, b. conc. surf. 14.293 mi. Proj. S 88 (3), Wells Co.;

Announcing

Milcor Ribform

...a new, stronger form for short-span concrete slabs

Milcor Ribform is a new, permanent, high-strength steel form for concrete floor-and-roof-slabs poured over steel joists or beams. It is quickly laid in sheets and welded to the steel supports where it becomes a rigid, non-porous base for the concrete.

This newest addition to Milcor's growing family of quality building products is fabricated from a high-tensile steel and has a unique ribbed shape that is stronger than ordinary corrugated patterns.

Being a rigid type of centering, Ribform never need be stretched during installation. It cannot twist or deform the joists. No expensive temporary bracing is required.

Ribform can be used to form concrete slabs over pipe trenches or other inaccessible locations where it is impractical and expensive to "strip" wood forms.

Send for Technical Bulletin 2.5.11.

MILCOR® Ribform

Ribform is easy to handle. Just weld it to the joists —the rigid sheets need no supplementary bracing.

INLAND STEEL PRODUCTS COMPANY
DEPT. F, 4147 W. BURNHAM ST. • MILWAUKEE 1, WISCONSIN
BALTIMORE • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND
DALLAS • DENVER • DETROIT • KANSAS CITY • LOS ANGELES
MILWAUKEE • MINNEAPOLIS • NEW YORK • ST. LOUIS

M-176A

RUBBING CEILINGS?

Do it **GIRAFFE** *with a*

GIRAFFE CEILING GRINDER

- **FASTER AND EASIER:** One man will average almost 4000 sq. ft. per day. Does not need scaffolding.
- **CHEAPER AND BETTER:** Money saved on finishing will help pay for grinding.
- **DEPENDABLE:** Individual GIRAFFES have worked more than 1,000,000 square feet without major overhaul.

•

Heights up to 24 ft.

GIRAFFE

Has been adapted to cleaning ceilings.

CONCRETE GRINDING CORP.
300 STRAIGHT ST. PATERSON, N. J.

N. D.—**W. H. Noel Co.**, Jamestown, N. D. LB **$319,750**. base, b. conc. surf. 14 mi. Proj. F 109 (6), Griggs Co.;

N. D.—**Megarry Bros.**, St. Cloud, Minn. LB **$457,992**. base, b. conc. surf. 18.639 mi., Proj. F 122 (3), F 214 (3), LaMoure and Ransom Counties;

N. D.—**N. W. Engr. Co.**, Rapid City, N. D. LB **$158,235**. A.E.P.C., c. conc. 0.878 mi. Proj. U 225 (6), U 608 (6), Grand Forks Co.;

N. D.—**Northern Improvement Co.**, 633 First Ave. N., Fargo, N. D. LB **$121,928**. base, bit. surf. tr. 8.909 mi., Proj. S 441 (1), Pembina Co.; LB **$149,076**. soil cement base, b. conc. surf. 4.044 mi. Proj. S 143 (4), Cass Co.;

N. D.—**David & Rix**, Bismarck, N. D. LB **$487,142**. grading, 8.005 mi., Proj. S 616 (2), Oliver and Mercer Counties;

N. D.—**Henry Luehr**, Pettibone, N. D. LB **$123,975**. grading, 13.522 mi. Proj. S 692 (3), McLean Co.;

N. D.—**Wm. Collins & Son**, 606 Black Bldg., Fargo, N. D. LB **$366,309**. base, b. conc. surf. 15.003 mi. Proj. S 268 (3), Ramsey and Walsh Counties;

N. D.—**Peter Kiewit Sons Co.**, 1024 Omaha National Bank Bldg., Omaha, Neb. LB **$546,633**. b. conc. surf. 29.398 mi. Proj. F 279 (16) and IN 01-6 (1), Stutsman Co.;

N. D.—**Bober Constr. Co.**, Minot, N. D. LB **$75,011**. grading, 11.107 mi. Proj. S 755 (2), Williams Co. Bids May 25. CD 5/9.

▲† **Boyle & Lovering**, 59 W. Kellogg Blvd., St. Paul, Minn. CA **$1,530,957**. Schedule 1, constr. utilities and bldgs., Minot Air Force Base, MINOT, N. D. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. CD 5/18, under LB.

† **Sweetman Constr. Co.**, 100 S. Kadota St., Sioux Falls, S. D. CA **$689,277**. runway, taxiways, apron Municipal Airport, Inc. 25-060-56-68, SIOUX FALLS, S. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. CD 5/18, under LB.

NEBRASKA—State Dpt. Roads & Irrigation, Lincoln,

Booth & Olson, 529 Insurance Exchange Bldg., Sioux City, Iowa. LB **$81,265**. culverts Bancroft-Decatur, FA-S 446, Burt Co. Bids May 24. CD 5/15, under Streets and Roads.

▲ NEBRASKA—State Dpt. Road & Irrigation, Lincoln,

Neb.—**Capital Bridge Co.**, 1001 N. 9 St., Lincoln, Neb. LB **$81,406**. grav. culvert, bridge, guard rail, Bancroft North, FA-S 94, Cuming Co.;

Neb.—**Dobson Bros. Constr. Co.**, 503 First National Bank Bldg., Lincoln, Neb. LB **$261,523**. grav. detour, guard sub-base, shoulder, subgrade, soil aggregate FA-F-45, Vesta-Tecumseh-Johnson Co.;

Neb.—**F. R. Orsbeck**, Fremont, Neb. LB **$458,188**. grav. detour, gran. sub., bit. Bancroft-Decatur, FA-S-446, Burt Co. LB **$189,210**. grade, pave, oil Adams St. in Lexington, US-429. LB **$487,664**. Columbus-Schuyler, FA-F 58 and 180, Platte and Colfax Counties;

Neb.—**Inland Constr. Co.**, 3867 Leavenworth St., Omaha, Neb. LB **$118,914**. seal bit. surf. course Lake east and west, FA-S-695, Cherry Co.;

Neb.—**Missouri Valley Constr. Co.**, Grand Island, Neb. LB **$455,561**. grav. detour, pave, culvert guard Louisville-Syracuse, Weeping Water West, Avoca north, FA-F-452 S-157 and 682, Cass Co.;

Neb.—**Arnold Swanson Co.**, Hastings, Neb. LB **$189,185**. grade detour, culvert, seed, bridges, guard, gran. sub-base, soil aggregate Chappel southeast, FA-S-398, Deuel Co. Bids May 24. CD 5/15.

Griffin Constr. Co., Merriam, Kan. CA **$152,082**. WW improv., RED CLOUD, NEB. City, Red Cloud, Neb. Bids May 24. CD 5/7.

† **Floyd J. Freeman**, 724 Laird St., Lawton, Okla. LB **$565,462**. battalion motor pool facilities, ENG-34-066-56-57, FORT SILL, OKLA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids May 23. CD 4/12.

▲ **B & M Constr. Corp.**, Republic Bldg., Oklahoma City 2, Okla. LB **$3,851,891**, est. $3,381,500. 4q mi. 8- to 48-in. c.i. water mains, OKLAHOMA CITY, OKLA. City, City Hall, Oklahoma City, Okla. Bids May 29. CD 5/23;

Tecon Corp., 1201 Main St., Dallas, Tex. LB **$111,830**, est. $118,828, 6,000 ft. 20 in. steel water mains, over North Canadian River, (Oklahoma City, Okla.).

† **Heldenfels Bros.**, P.O. Box 1917, Corpus Christi, Tex. CA **$519,000**. reseal and repair runways-taxiways, Naval Air Staton, NOy 91227, CORPUS CHRISTI, TEX. Bureau Yards & Docks, Dpt. Navy, Admin. Bldg. 1, Naval Air Station, Corpus Christi, Tex. Bids Apr. 20. CD 4-2, under LB.

J. E. Beaulaurier & Sons, 814 25 St. N., Great Falls, Mont. LB **$124,774**. (6 bidders) alter, enlarge airport admin. bldg., GREAT FALLS, MONT. City, City Hall, Great Falls, Mont. McIver, Hess & Haugsjaa, 603 Strain Bldg., Great Falls, Mont., archts.

BUILDINGS—LB & CA

Madsen Constr. Co., 2110 Nicollet Ave., Minneapolis, Minn. CA **$250,000**. general constr. MANUFACTURING BLDG. on Hy. 55, 1½ mi. south of Minnesota Bridge, BLOOMINGTON (P. O. MINNEAPOLIS), MINN. Loll Engineering Co., 7716 Cedar Ave., Bloomington, Minn. Abbett & Griswold, 1409 Willow St., Minneapolis, Minn., engrs.

D. L. Witcher, Inc., Builders Exchange Bldg., Minneapolis, Minn. LB **$940,189**. general constr. SENIOR HIGH SCHOOL addn., CROOKSTON, MINN. Bd. Educ., G. E. Kronholm, clk., Crookston, Minn. Bids May 24. CD 5/3.

Knutson Constr. Co., 3000 E. Hennepin Ave., Minneapolis, Minn. LB **$160,837**. (3 bidders) general constr. 1 story, 160x175 ft. warehouse, 1 story, 75x50 ft. office section for FACTORY "East of the White House", GOLDEN VALLEY (P. O. MINNEAPOLIS) MINN. W. H. Schaper Mfg. Co., 1800 Olson Hy., Golden Valley, Minn. Bids May 18. CD 5/17.

The Austin Co., 1o112 Euclid St., Cleveland, O. CA **$120,000**. 1 story, 180x199 ft., 1 story, 180x79 ft. FACTORY addns., MINNEAPOLIS, MINN. Scott-Atwater Co., 2901 E. Hennepin Ave., Minneapolis, Minn. G. Miller, 2145 Palace St., St. Paul, Minn., archt.

Robert Paulus Constr. Co., 3441 Morganford Rd., St. Louis 16, Mo. CA Est. **$344,000**. 2 story, bsmt., 36x92 ft. and 63x119 ft. brick, concrete L-shaped HIGH SCHOOL, Switzer Ave. and Jennings Rd., JENNINGS (ST. LOUIS 21 P. O.), MO. Corpus Christi Parish, c/o Archdiocesan Bldg. Comn., Rev. James R. Hartnett, exec. secy., 3810 Lindell Blvd., St. Louis 8, Mo. Bids May 10. CD 5/2.

Kingery Constr. Co., 1941 Y St., Lincoln, Neb. LB **$805,785**. 2 story, 179x206 ft., brick, steel ARMORY and 1 story, 4-unit, MOTOR VEHICLE STORAGE BLDG., LINCOLN, NEB. Nebraska National Guard, Capitol Bldg., Lincoln, Neb. Bids May 25. CD 5/3.

▲ **Harmon Constr. Co.**, 28 S. Indiana St., Oklahoma City, Okla. LB **$1,504,997**, est. $1,000,000. 14 story OFFICE and PARKING BLDG., N. W. 2nd St., OKLAHOMA CITY, OKLA. Liberty National Bank & Trust Co., Liberty Bank Bldg., Oklahoma City, Okla. Bids May 21. CD 5/25.

Baytex Home Builders, Baytown, Tex. Owner Builds, **$358,000**. 35 DWELLINGS, **$360,000**. 40 DWELLINGS, BAYTOWN, TEX. CD 4/4.

▲ **BMFP Constr. Co.**, 2110 Ave. C., Lubbock, Tex., CA **$995,869**. brick, steel-concrete frame HIGH SCHOOL, DENVER CITY, TEX. Sligo Independent School Dist., Denver City, Tex. Bids May 10. CD 5/23, under LB.

Brown Development Co., 1249 Oak Grove Rd., Ft. Worth, Tex. Owner Builds, **$504,000**. 42 RESIDENCES, Oak Grove, Stafford Dr. and Roma Lane, FORT WORTH, TEX. CD 4/18.

Linbeck Constr. Co., Box 13007, Houston, Tex., LB **$889,000**, est. $650,000. 2 girls' DORMITORIES, HOUSTON, TEX. The Mary Gibbs Jones College of Rice Institute, Main St., Houston, Tex. Bids May 22. CD 5/9.

Marshall Constr. Co., Inc., Box 7538, Houston, Tex. LB **$947,680**. 160,000 sq. ft. rein.-con. brick SHOPPING CENTER, HOUSTON, TEX. Port City Village Corp., c/o Irving R. Klein & Assocs., archts., 1317 Austin St., Houston, Tex. Bids May 21. CD 5/9.

E. J. Burke & Sons, 2000 Goliad Rd., San Antonio, Tex., Own Forces. **$750,000**. SHOPPING CENTER, PORT LAVACA, TEX. CD 4/18.

Busboom & Rauh, 6910 Forest Park Rd., Dallas, Tex., CA **$548,519**. 3 SCHOOL addns., RICHARDSON, TEX., Richardson Independent School Dist., Richardson, Tex. Fred Buford & Assocs., 326 Interurban Bldg., Dallas, Tex., archts. Bids May 22.

▲ **Naranche & Konda**, 2801 S. Montana Ave., Butte, Mont. CA Est. **$2,000,000**. DISTRIBUTION CENTER, incl. 123,000 sq. ft. grocery and warehouse, 21,000 sq. ft. meat bldg., 52,000 sq. ft. perishable bldg., repair shop, truck equip., area, BUTTE, MONT. Safeway Stores, Inc., Mayer Bldg., Butte, Mont. Norman Hamill & Assoc., 122 W. Granite St., Butte, Mont., archts. CD 6/2/55.

B. H. Baker Ltd., P. O. Box 173, Colorado Springs, Colo. CA **$469,099**. 5 story, 45x191 ft. DORMITORY, LAUNDRY and STORAGE BLDG., BUENA VISTA, COLO. State Reformatory, Buena Vista, Colo. Bids May 24, awarded May 25. CD 5/8.

FAR WEST

BUILDINGS—BA

▲ **Wash., Edmonds**—HIGH SCHOOL—BA 7/3—School Dist. 15, Edmonds, 1 story 156,000 sq. ft. steel frame high school. $2,000,000. Plans deposit $50. Waldron & Dietz, 208 Columbia St., Seattle, Zone 4, archts. CD 11/3.

† **Ore., Baker**—CENTER STATION—BA 7/6—U. S. Eng., City-County Airport, Walla Walla, Wash., direction center station, two 10 acre sites 25 mi. apart, at Baker and Beaver Mountain, with bldgs., utilities, etc., ENG-45-108-58-66. Plans deposit $50.

HEAVY CONSTRUCTION—LB & CA

† **W. R. Cahoon Constr. Co.**, Pocatello, Idaho. LB **$579,891**, American Falls pumping plant and discharge line, Michaud Flats Proj., Spec. DC 4670, IDAHO Bureau Reclamation, Dpt. Interior, Rupert, Idaho. Bids May 22. CD 5/28.

† **Cherf Brothers, Inc. & Sandkay Contractors**, Ephrata, Wash., LB **$588,034**, est. $543,221. earthwork, structures for Block 77, laterals, wasteways and drain West Canal Laterals, Columbia Basin Proj., Spec. DC 4668, WASHINGTON. Bureau Reclamation, Dpt. Interior, Ephrata, Wash. Bids May 22. CD 3/27.

† **Dpt. Army, Purch. & Contg. Officer**, Fort Lewis, Wash., cancelled bids to have been opened June 1, picnic store and shelter at enlisted men's beach, Inv. 56-1238, FORT LEWIS, WASH. CD 5/25.

† **Boyles Bros. Drilling Co.**, 1321 S. Main St., Salt Lake City, Utah. LB **$189,686**, est. $145,138. foundation drilling at John Day Dam site, CIVENG-45-164-56-68, OREGON. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids May 24. CD 5/7.

† **P. Wks. Officer, Thirteenth Naval Dist.**, Naval Station, Seattle, Wash. cancelled bids to have been opened May 29, construct entrance roads to bldgs. and parking apron at Air Force Base, Spec. 2005/56, KLAMATH FALLS, ORE. CD 5/16.

John L. Jersey, 3647 S.E. 34 St., Portland, Ore. LB **$200,000**. grading at Rockwood industrial tract, PORTLAND, ORE. Union Pacific R. R. W. C. Perkins, ch. engr., 1416 Dodge St., Omaha, Neb. Awarded May 23.

▲† **Mittry Constr. Co.**, 2960 Marsh St., Los Angeles 39, Calif. LB **$6,179,639**, est. $7,165,409. (8 bid-

(Continued on page 114)

SEND FOR THE V-BEAM CATALOG TODAY.

How to open doors to CONTRACT AWARDING

The man with the V-BEAM bid not only opens doors, he closes contracts.

He has a structural support for floors and roofs that is lighter, more economical and yet has an actual carrying capacity of over twice the published loadings.

Macomber V-BEAMS extend construction dollars, and their proof of performance has been recorded by the industry's most honored proving ground—The Pittsburgh Testing Laboratory.

YOU CAN PROVE THE SOLID STRUCTURAL AND ECONOMIC VALUES OF V-BEAMS OVER ALL OTHER FLOOR AND ROOF SUPPORTS IN JUST ONE PROJECT WITHIN THE 48 FOOT SPAN RANGE.

STANDARDIZED STEEL BUILDING PRODUCTS

MACOMBER INCORPORATED

CANTON 1, OHIO

• ENGINEERING • FABRICATING AND ERECTING •

NAILABLE STEEL JOISTS
•
LONGSPANS
•
BOWSTRING ROOF TRUSSES
•
METAL DECK
•
V-LOK STEEL FRAMING
•
STRUCTURALS

TIPS FROM GURLEY
Beat the wind with an
Optical Plummet Transit
Built-in optical plummet eliminates swing and sway of cord and plumb bob. Positive accuracy of set-up assured. Special tripod is standard equipment.
Write for Bulletin OP-57.
Have you tried Variable Power?
Variable Power, now standard on all Gurley transits and levels, permits wide range of magnification with one eyepiece. Change magnification to suit weather, light. Write for "Facts on VP"
VP
W. & L.E. Gurley
Union Plaza, Troy, N. Y.
SINCE 1845

SAVE
MONEY
when pouring concrete
RENT
ECONOMY
STEEL FORMS
Easily and
quickly assembled
Complete supervisory service
Adaptable to wide use
Save time and material
Other forms available
on a purchase basis
Write for catalog to
ECONOMY FORMS CORP.
HOME OFFICE • DES MOINES, IOWA
DISTRICT SALES OFFICES: St. Louis, Mo. • Kansas City, Mo. • Lincoln, Neb. • Minneapolis, Minn. • Ft. Wayne, Ind. • Milwaukee, Wisc. • Cincinnati, Ohio • Cleveland, Ohio • Metuchen, N. J. • Rochester, N. Y. • Springfield, Mass. • Washington, D. C. • Decatur, Ga. • Dallas, Texas • Los Angeles, Calif. • Oakland, Calif. • Denver, Colo.

(Continued from page 112)

ders) Vaquero Dam, Santa Maria Proj., Spec. DC 4676, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Santa Maria, Calif. Bids June 1. CD 4/27.

▲† **F. E. Young Constr. Co.**, 2141 Main St., San Diego, Calif., LB $6,441,444 (4 bidders) special weapons training facilities, Naval Air Station, Spec. 49516, SAN DIEGO, CALIF. Eleventh Naval Dist., San Diego, Calif. Bids May 25. CD 5/3.

BUILDINGS—LB & CA

▲ **Paulsen Constr. Co.**, 1425 Jefferson St., Salt Lake City, Utah, LB $2,349,575, general constr. Highland HIGH SCHOOL, SALT LAKE CITY, UTAH. Bd. Educ., 440 E. First South St., Salt Lake City, Utah. Bids May 29. CD 5/4.

Sceva Constr. Co., Inc., N 2928 Madelia St., Spokane, Wash., LB $426,917, est. $390,000, general contract masonry HIGH SCHOOL and GRADE SCHOOL addn., DAVENPORT, WASH. School Dist. 207, Davenport, Wash. Bids May 24.

A. Ritchie & Co., Box 516, Walla Walla, Wash., CA, $723,099. HIGH SCHOOL, WAPATO, WASH. School Dist. 207, Wapato, Wash. Bids Apr. 24. CD 5/1, under LB.

Smith-Phillips Co., 7402 S. W. Macadam Ave., Portland, Ore. LB $874,969. HIGH SCHOOL, ASTORIA, ORE. Astoria School Dist., Astoria, Ore. Bids May 25. CD 5/1.

Paul B. Merick, 4540 S. E. 174 St., Portland, Ore. LB $489,000. (3 bidders) Elementary SCHOOL, HOOD RIVER, ORE. Hood River School Dist., Hood River, Ore. Edmundson, Hochendoerfer & Kennedy, Henry Bldg., Portland, Ore., archts.

Vandruff Development Co., 8021 E. Rome Ave., Anaheim, Calif., CA $538,000. 49 frame, stucco DWELLINGS, Tract 2876, ANAHEIM, CALIF. Jade Builders, 8021 E. Rome Ave., Anaheim, Calif.

Weiss Constr. Co., 305 N. Robertson Blvd., Los Angeles, Calif., CA, $767,000, 49 frame, stucco DWELLINGS, Broadway and Orange Sts., ANAHEIM, CALIF. Pennant Homes, 305 N. Robertson Blvd., Los Angeles, Calif.

Vandruff Builders, 8021 E. Rome Ave., Anaheim, Calif., CA, $444,000. 37 frame, stucco DWELLINGS, Tract 2874, ANAHEIM, CALIF. Robin Hood Builders, 8021 E. Rome Ave., Anaheim, Calif.

Vandruff Builders, 8021 E. Rome Ave., Anaheim, Calif., CA, $638,140. 54 frame, stucco DWELLINGS, Tract 2876, ANAHEIM, CALIF. Emerald Builders, Inc., 8021 E. Rome Ave., Anaheim, Calif.

Vandruff Development, Inc., 8021 E. Rome Ave., Anaheim, Calif., CA, $468,000. 39 frame, stucco DWELLINGS, Tract 2875, ANAHEIM, CALIF. Dorie Builders, 8021 E. Rome Ave., Anaheim, Calif.

Vandruff Development, Inc., 8021 E. Rome Ave., Anaheim, Calif., CA, $468,000. 39 frame, stucco DWELLINGS, Tract 2875, ANAHEIM, CALIF. Amethyst Builders, 8021 E. Rome Ave., Anaheim, Calif. CD 4/18.

Vandruff Builders, Inc., 8021 E. Rome Ave., Anaheim, Calif., CA, $504,000. 42 frame, stucco DWELLINGS, Tract 2874, ANAHEIM, CALIF. Mojave Builders, Inc., 8021 E. Rome Ave., Anaheim, Calif.

Flowers & Shirley, 1021 W. 6 St., Los Angeles, Calif., LB $581,000, est. $579,879, JUNIOR HIGH SCHOOL addns., CULVER CITY, CALIF. Culver City Unified School Dist., 4034 Irving Pl., Culver City, Calif. Bids May 22. CD 5/4.

McDonald Brothers, 2639 S. La Cienega Blvd., Los Angeles, Calif., CA, $829,675, mechanical SHOPS and OFFICE, 2630 N. Main St., LOS ANGELES, CALIF. Los Angeles Dpt. Water & Power, 311 S. Spring St., Los Anegles, Calif.

CANADA

▲ **Que., Montreal**—BA 6/19—National Harbor Bd., West Block, Ottawa, Ont., grade separation Southern approach to Jacques Cartier Bridge (3 subways, A.B.C. Montreal Harbor) $1,000,000. Plans deposit $50. CD 9/9.

† **N. S., Debert**—WATERPROOFING, etc.—BA 6/20—Defence Constr. Ltd., 56 Lyon St., Ottawa, Ont. waterproofing and moulding 8 explosive storage bldgs., R.C.A.F. Station, $900,000. Plans deposit $100.

BUILDINGS—SLC

Ont., Toronto—FACTORY, etc.—Eastern Power Devices Ltd., 29 Wabash Ave., soon lets contract, 1 and 2 story, 120,000 sq. ft. factory and office. Over $250,000. A. G. Facey, 991 Bay St., archt. Edgar A. Cross & Assocs., 991 Bay St., engrs.

Que., Rock Forest—JUVENAT—L'Ordre des Freres Maristes, Iberville, soon lets contract, one wing, 4 story, 120x280 ft.; other wing 2 story 180x289 ft., rein.-con. brick juvenat for religious order, $700,000. Audet, Tremblay & Audet, 1100 Prospect St., Sherbrooke, archts. Cote, Lemieux, Carignan & Bourque, 144 Vimy St. N., Sherbrooke, engrs. CD 2/9.

Que., Three Rivers—CHURCH, etc.—LaFabrique de la Paroisse St. Sacrement, 1775 St. Louis Blvd., church and presbytery, $500,000. Jean Louis Caron, 502 Bonaventure St., archt. CD 12/8.

HEAVY CONSTRUCTION—LB & CA

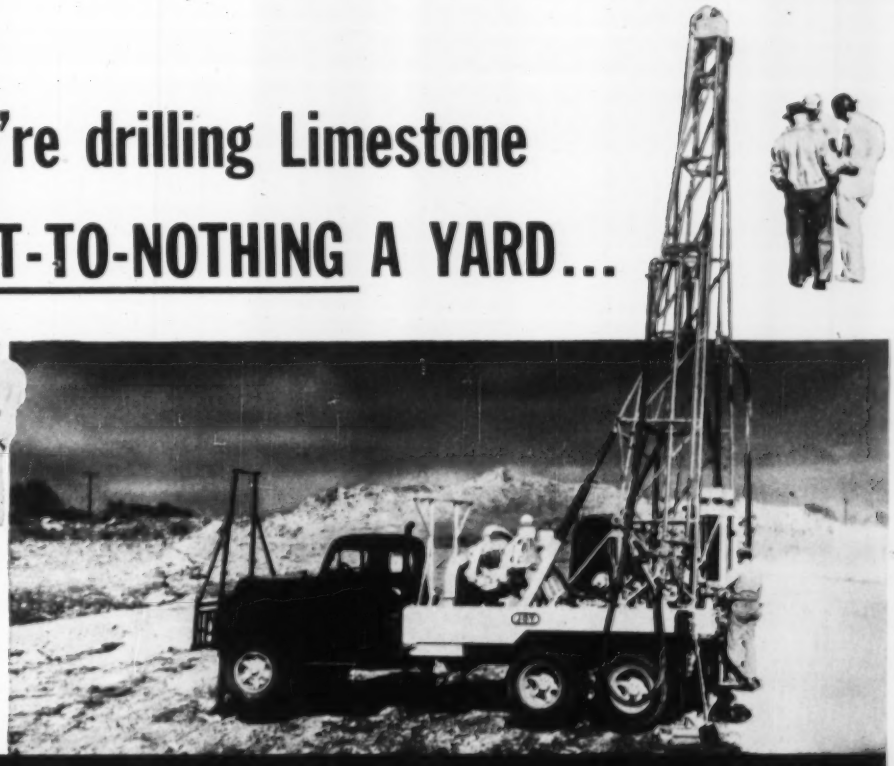
▲ **ALBERTA**—Alberta Govt., Parliament Bldg., Edmonton.

Alta.—**Standard Gravel & Surfacing**, 5340 1 St. S.W., Calgary, Alta., CA, $466,075; stab. grav. base course 15 mi. Hy. No. 16 from east of Pedley to Hinton; CA, $518,922, stab. grav. base course 15 mi. Hy. 16 from Hinton to Jasper Park boundary.

Alta.—**New West Constr. Co. Ltd. & Western Constr. & Lumber Co. Ltd.**, Edmonton, Alta., CA, $539,299.

(Continued on page 116)

They're drilling Limestone for NEXT-TO-NOTHING A YARD...



...with this JOY "Blastair Drill"

In a Texas limestone quarry, a Joy Model 225 "Blastair" Drill set the following performance record . . . with a drilling cost of *less than two cents a cubic yard:*

Bit Size		6¼"
Footage Per Shift		300
Labor Cost Per Shift (Driller & Helper)	$20.80	
Fuel Cost Per Shift	5.00	
Lubricating Oil Cost Per Shift	2.00	
Total Labor & Fuel Cost Per Shift		$27.80
Labor & Fuel Cost Per Foot	$ .093	
Bit Cost Per Foot	.134	
Total Labor, Fuel, Bit Cost Per Foot		.227
Cubic Yards Broken Per Foot		13
Total Drilling Costs Per Cubic Yard		.0174

Performance figures will vary, of course, with other formations. However, they show the possibilities of cutting *your* drilling costs with this outstanding Joy drill.

The "Blastair" is a truck-mounted, rotary, "air-blast" drill. It is a fast mover between holes and is easy to set up in drilling position. Its outstanding features include hydraulic automatic chuck, heavy-duty hoisting drum, oil-bath chain-case power unit, and rugged sectional mast. It is a real top-performance, low-maintenance machine that is ideal for the rough jobs of quarry and open-cut mine drilling.

Find out for yourself how the Joy "Blastair" can cut drilling costs on your job as it did this. Write today for Bulletin RM-709 to **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

GASOLINE OR DIESEL DRIVE • 6¼" MAX. DIA. HOLE
20' FEED • DRAG OR ROTARY-CONE TYPE BITS

Consult a Joy Engineer

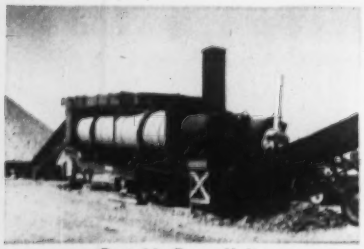
Write for FREE Bulletin 85-24

W&O M5585

JOY

PIONEER AND WORLD'S LARGEST MANUFACTURER OF ROTARY BLAST HOLE DRILLS

NEW *Batch Type Asphalt Mixing Plant*


Portable Dryer Unit

Gradation Unit, showing operator's platform.

(Capacity 100-180 TPH)

This completely portable new batch type plant is built in two sizes—M-40 (100 to 120 TPH) and M-60 (150 to 180 TPH).

All units are wheel mounted, and no crane is needed for erection. Plant can be moved from one job to another and set up in a minimum of time. All piping and wiring are permanently installed—with quick disconnects.

The design and engineering of this plant provide a flexible setup arrangement. All remotely located units are driven with electric motors. No shafts, universal joints, chairs, gears, etc. Meets all State specifications.

The complete plant—tanks, oil heater, power units, piping, etc., are available from one source. For complete information see your nearest H & B distributor or write direct.

HETHERINGTON & BERNER INC. • *Engineers . . . Manufacturers*

730 KENTUCKY AVENUE INDIANAPOLIS 7, INDIANA

TEST BORINGS

for

- COAL
- MINERALS
- DAMS & BRIDGES
- BUILDINGS

We Look into the Earth

PENNSYLVANIA Drilling CO.

DRILLING CONTRACTORS AND MFRS.
PITTSBURGH 20, PA.

The BELMONT IRON WORKS

Engineers — Fabricators — Erectors
Contractors — Exporters
Cable address—Beliron

STRUCTURAL STEEL
BUILDINGS & BRIDGES
RIVETED — ARC WELDED

Shops: Eddystone, Pa.—Philadelphia, Pa. Royersford, Pa.

22nd St. & Washington Ave. Philadelphia 46, Pa. Main Office

AISC

New York Office 44 Whitehall St., N. Y. 4, N. Y.

(Continued from page 114)

stab. grav. base course 13 mi. Hy. 43 from Whitecourt to west of Chickadee Creek;

Alta.—**Poole Eng. Co. Ltd.**, 10503 109 St., Edmonton, Alta., CA, $1,123,166, stab. grav. base course and asph. plant mix surf. 16 mi. Hy. 2 from south of Springburn to north of Nampa, also Peace River Hill about 14 mi. and Nampa to Peace River;

Alta.—**Continental Constr. Ltd.**, Medicine Hat, Alta., CA, $348,963, grading, etc. 12 mi. Hy. No. 14 Wainwright to north of Heath;

Alta.—**Assiniboia Constr. Co. Ltd. & M. E. L. Constr. Ltd.**, Calgary, Alta., CA, $313,054, grading .013 mi. Hy. 23 from Champion to Vulcan;

Alta.—**Midland Eng. Ltd.**, Calgary, Alta., CA, $273,720, grading, etc. 9 mi. Hy. No. 2 from Aldersyde to High River;

Alta.—**Mannis-Coleman**, c/o 330 7 Ave. S.W., Calgary, Alta., CA, $237,290, grading, 8 mi. Hy. 13 from Hughenden to Ribstone Creek. Grand total $3,820,489. Awarded May 22. CD 12/1/43.

▲ **South Durham Steel & Iron Co. Ltd.**, Middlesborough, England, CA, $32,000,000, supplying 24- to 36-in. pipe for natural gas pipe line from Alberta to eastern Canada, ALBERTA AND ONTARIO. Trans-Canada Pipe Lines Ltd., 505 8 Ave., Calgary, Alta. Awarded May 28, Bechtel-Mannix-Hester, 825 Eglinton Ave. W., Toronto, Ont., designer-contractor. CD 5/29.

Welland Tubes Ltd., Welland, Ont., CA, $45,000,000, supplying 878 mi. 30 in. pipe for natural gas pipe line. Awarded May 31. (Alberta and Ontario).

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria.

B. C.—**Emil Anderson Constr. Co.**, Hope, B. C., LB $1,583,148. Proj. 754, Cottonwood River to Strathnaver section of Cariboo Hy.;

B. C.—**Highway Constr. Co. Ltd.**, River Rd., Lulu Island, Vancouver, B. C., LB $795,582, Proj. 694 reconstr. 2.75 mi. Trans-Canada Hy. Boston Bar to Salkel Flats. Bids May 24. CD 5/10.

▲ **General Constr. Co. Ltd.**, Granville Island, Vancouver, B. C., LB $1,687,790, grading Mile 194 to Mile 228 on Dawson Creek line on Pacific Great Eastern Railway, BRITISH COLUMBIA. B. C. Govt., Parliament Bldgs., Victoria, B. C.

NOVA SCOTIA—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.

Modern Constr. Ltd., Salisbury Rd., Moncton, N. B., LB $469,682, grading, culverts, base course along 5.3 mi. Cabot Trail in Cape Breton National Park, Ingonish. Bids May 23. CD 5/16.

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto, Ont.—**Jack Both Ltd.**, 18 Gordon St., Belleville, Ont., LB $271,954. Contract 56-33, grading, culverts, gran. base, 1 structure 7.4 mi. development road Cobden;

Ont.—**McNamara Constr. Co. Ltd.**, 42 Industrial St., Toronto, Ont., LB $457,446, Contract 562-9, grading, culverts, gran. base 4.76 mi. Hy. No. 2, Iroquois. Bids May 23. CD 5/18.

Robinson Contr. Co. Ltd., Parkdale Ave. N., Hamilton, Ont., CA $989,000, approx. 25,118 ft. 10- to 66-in. dual pipe sewers and monolithic concrete box sewers, HAMILTON, ONT. City, City Hall, Hamilton, Ont. Bids May 9, awarded May 28. CD 5/22, under LB. S. McNally & Sons Ltd., Hamilton, Ont. low bidder.

▲ **A. Janin & Co. Ltd.**, 1460 Sherbrooke St. W., Montreal, Que., LB $1,218,975 (only bidder) 160-ft. span structural steel hangar, steam and electrical distr. sys., R.C.A.F. Station, BAGOTVILLE, QUE. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Bids May 24. CD 5/2.

▲ **J. P. Cartier, Ltd.**, 1819 Glendale Ave., Montreal, Que. CA $1,026,300, exten.; wid'n. Burnside Ave. from Stanley to Guy Sts., MONTREAL, QUE. City, City Hall, Montreal, Que. Bids Apr. 25, awarded May 25. CD 5/9, under LB.

Edouard Monette, 2190 Gouin Blvd. E., Montreal, Que., CA, $85,578, sewers in Metropolitan Blvd. from St. Lawrence Blvd., MONTREAL, QUE. City, City Hall, Montreal, Que. Awarded May 18. CD 5/10, under LB.

SASKATCHEWAN—Sask. Govt., Regina.

Sask.—**W. C. Wells Constr. Co. Ltd.**, Saskatoon, Sask., CA, $147,900, grading 21.6 mi. Hy. 14 from Biggar to its junction with No. 51 Highway and from its junction with No. 14 Highway to Spring Water;

Sask.—**South Brothers**, Regina, Sask., CA, $75,500, grading 12.48 mi. Hy. No. 14 from Unity West;

Sask.—**McKay Brothers**, Saskatoon, Sask., CA, $87,000, grading 17 mi. Hy. No. 31 from Herschel to 4½ mi. south of Plent;

Sask.—**Ferguson Constr. Co. Ltd.**, North Battleford, Sask., CA, $76,000, grading 13.8 mi. Hy. 249 from Battleford southwest;

Sask.—**Henderson Bros. & Burton**, Vanguard, Sask., CA, $87,000, grading 11.26 mi. Hy. 16 from Wawota to its junction with No. 9 Highway;

Sask.—**Jonnson Bros. & Ostberg**, Nipawin, Sask., CA, $158,500, grading 25.57 mi. Hy. No. 55 from east of Weirdale to its junction with Hy. No. 2, Grand total $631,900. Awarded May 22. CD 10/1/43.

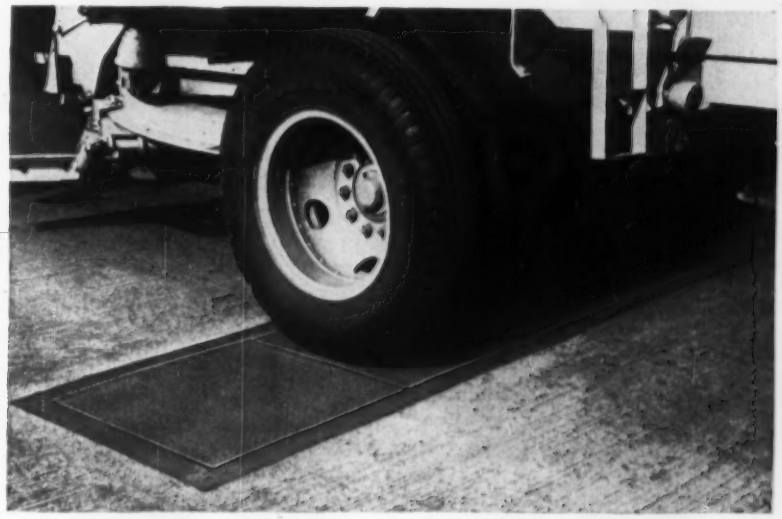
▲ **Bird Constr. Co. Ltd.**, 7 and Smith Sts., Regina, Sask. CA, $599,561, 110,000 sq. yd. c. conc. base pavement complete with curb, gutter and concrete walk; CA $124,345 25,000 ft. concrete curb and gutter; 132,000 ft. concrete walk; CA, $113,400, replacing 80,000 sq. ft. concrete walk, 13,000 ft. concrete curb, gutter, REGINA, SASK. City, City Hall, Regina, Sask. Bids Apr. 30, awarded May 15. Grand total $1,042,062. CD 4/26;

Wappel Concrete & Constr. Co. Ltd., Regina, Sask. CA, $204,756 combined sidewalk and curb, 240,000 sq. ft. concrete walk and 60,000 ft. concrete curb. (Regina, Sask.)

BUILDINGS—LB & CA

▲ **Burns & Dutton Concrete & Constr. Co. Ltd.**, 9004 125 Ave., Edmonton, Alta., CA, $1,116,435, 3 story,

(Continued on page 118)



NOW

no long line of waiting vehicles!

Truck wheels roll over the "Weigh-tronic" platform imbedded in the highway. If the axle load exceeds a pre-set level, an alarm is instantly signalled to the "Weigh-tronic" recording unit which may be located several hundred feet away!

NEW

TALLER & COOPER'S "WEIGH-TRONIC" system

NOW . . . available to law enforcement agencies and highway research organizations . . . the Weigh-tronic Systems, Taller & Cooper's new electronic truck scales, the fastest, most accurate and dependable vehicle-weighing device to date.

measures axle load while a truck is in **motion!**

A product of T&C's 25 years of experience in electronic weighing, Weigh-tronic Systems are easily installed, conveniently operated by non-technical personnel.

Two "Weigh-tronic" Systems are presently available—Model ES-41, which measures individual axle loads of a vehicle in motion and Model ES-51, which weighs an entire vehicle with extreme precision.

Like all Taller & Cooper equipment, Weigh-tronic Systems are rugged in construction, simple in design and efficient in operation.

Write today for design and construction details.

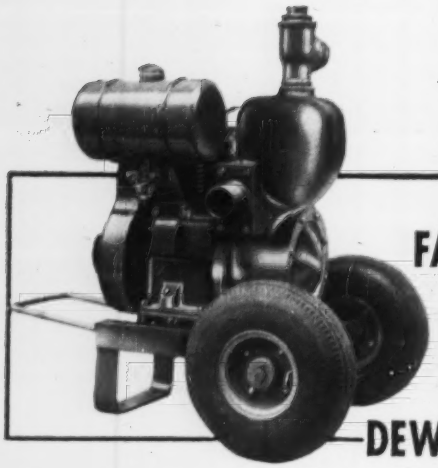
TALLER & COOPER, INC.

ENGINEERS • MANUFACTURERS

75 Front Street • Brooklyn 1, N. Y.

Toll Collection Systems • Toll Booths • Power Control Equipment • Digital Computers • Wind Tunnel Instrumentation • Special Purpose Instrumentation

TALLER & COOPER TOLL COLLECTION EQUIPMENT IS USED ON EVERY MAJOR TOLL FACILITY IN THE U. S.



FAIRBANKS-MORSE
DEPENDABLE
SELF-PRIMING
DEWATERING PUMPS

Thousands of these rugged, easily maintained dewatering pumps are used on construction and industrial jobs. Larger units are adaptable to bridge and caisson dewatering, sewer drainage, service at sewage treatment plants; marine salvage work, sea wall construction; mine stripping, coal, sand and gravel washing; well point predrainage, and for supplying water in large volume for road construction.

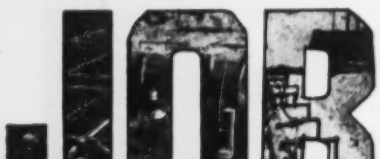
For detailed information about performance, capacities, hp. ratings, availability and other uses, write Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE
a name worth remembering when you want the BEST

PUMPS • WATER SYSTEMS • GENERATING SETS • MOWERS • SCALES
MAGNETOS • MOTORS • DIESEL LOCOMOTIVES AND ENGINES

IF IT'S A

WET



JOB

PLAY SAFE! ASK FOR A DEWATERING ANALYSIS BY

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

Precision built from Performance-Proven Design

The heart of the vertical turbine pump is the bowl. Layne pump bowls are precision built from performance-proven design—better built for better service.

Layne pumps are produced completely in the Layne plant by skilled craftsmen to Layne standards—the highest.

LAYNE
& BOWLER, INC.
MEMPHIS
General Offices and Factory
LAYNE ASSOCIATE COMPANIES
THROUGHOUT THE WORLD

Layne

Water Wells
Vertical Turbine Pumps
Water Treatment

(Continued from page 116)

part bsmnt., 140x400 ft., rein.-con., brick, ADMINISTRATION BLDG., Griesbach Army Barracks, EDMONTON, ALTA. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Bids Apr. 26, awarded May 22. CD 5/14, under LB.

▲ W. C. Well Constr. Co., 10519 115 St., Edmonton, Alta., CA, $1,000,000 (12 bidders) 180x235 ft., rein.-con. OFFICE BLDG., EDMONTON, ALTA. Imperial Oil Ltd., 102 St. and 100 Ave., Edmonton, Alta. Bids May 16, awarded May 25. CD 5/9.

▲ Christensen & Macdonald, 612 Tegler Bldg., Edmonton, Alta., CA, $2,000,000 (8 bidders) 2 story, bsmnt., 220x245 ft., rein.-con. SHOPPING CENTER, GARAGE and parking area, EDMONTON, ALTA. Simpson-Sears Ltd., 176 Yonge St., Toronto, Ont. Awarded May 25. CD 4/26/55.

Cameron Contracting Ltd., 77 Upper Water St., Halifax, N. S., LB $433,618 (8 bidders) SUPPLY BLDG., MAINTENANCE and UTILITIES BLDG. and entrance to Windsor Park at Military Base, HALIFAX, N. S. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont.

▲ Canadian Kellogg Co. Ltd., 194 Bloor St. W., Toronto, Ont., CA Est. $5,500,000, 40,000 bbl. per day CRUDE PROCESSING FACILITY, CLARKSON, ONT. British American Oil Co., Ltd., British American Oil Bldg., Toronto, Ont.

▲ Dominion Bridge Co. Ltd., Lachine, Que., CA Est. $1,250,000. fabrication and erection steel for 4 buildings to house cold reversing mill and annealing facilities; cold storage facilities and a pickle aisle; temper mill; coil storage at STEEL PLANT, HAMILTON, ONT. Steel Co. of Canada, Ltd., Wilcox St., Hamilton, Ont. Awarded May 28. CD 11/29.

Newman Brothers Ltd., 4A Clark St., St. Catharines, Ont. CA, $500,000 headframe for MINE, 50 ft. square, 240 ft. high concrete tower, MANITOUWADGE, ONT. Geco Mines Ltd., Suite 1715, 44 King St. W., Toronto, Ont. General Eng. Co., Ltd., 100 Adelaide St. W., Toronto, Ont., engrs. Awarded May 28.

Cutler Realty Co., c/o Paul Meschino, archt., 4831 Yonge St., Toronto, Ont. Owner Builds, $164,000. 1 story, 35,000 sq. ft. masonry, steel FACTORY, TORONTO, ONT. Victor G. Bardawill, 12 Charles St. E., Toronto, Ont., engr.

Alta Constr. Co. Ltd., 3444 St. Joseph Blvd. E., Montreal, Que., CA, $800,000. 50,000 sq. ft. rein.-con., steel, brick, block college GYMNASIUM and swimming pool, MONTREAL, QUE. Peres St. Croix, College St. Laurent, Montreal, Que. Larose & Larose, 8 Roxelawn Cres., Montreal, archts. Lalonde & Valois, Canada Cement Bldg., Montreal, Que., engrs. Awarded May 22.

Aim & Zakuta Ltd., 6910 Wiseman Ave., Montreal, Que., CA, $275,000 (5 bidders), 4 story, bsmnt., rein.-con., brick, block MANUFACTURING BLDG., MONTREAL, QUE. Tom Rossy, c/o deBelle & White, archts., 5925 Monkland Ave., Montreal, Que. Bids May 25. CD 5/8.

E. G. M. Cape & Co., 4898 Western Ave., Montreal, Que., CA, $750,000, reconstr. Brewery COOLING PLANT, MONTREAL, QUE. Molson's Brewery Ltd., 1670 Notre Dame St. E., Montreal, Que. McDougall, Smith & Fleming, 1235 McGill College Ave., Montreal, Que., archts. McDougall & Friedman, 1235 McGill College Ave., Montreal, Que., engrs. Awarded May 25.

▲ Domaine Development Corp., 4819 Park Ave., Montreal, Que. Owner Builds, $8,000,000, 750 bungalow HOUSING DEVELOPMENT, MONTREAL, QUE. David K. Linden, 310 Victoria Ave., Montreal, Que., town planning consultant. Central Mortgage & Housing Corp., 940 Cote de Liesse Rd., Montreal, Que., archts.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

† Cubiertas Constructionas, Madrid, Spain, CA $664,000, Group B Facilities (Spanish Air Base Program), MORON, SPAIN. Bureau Yards & Docks, Navy Dpt. 18 St. and Constitution Ave., N. W. Wash. 25, D. C., U. S. A. Bids Apr. 18, awarded May 10.

PROPOSED PROJECTS

WATER SUPPLY

Calif., San Rafael—City, City Hall, flood control and drainage sys. $950,000. W. Gunnason, City Hall, city engr.

▲ O. Batavia—Comrs. Miami Twp., Clermont Co., Batavia, water treatment plant, distr. sys. $1,500,000. J. H. Fuller, 202 Sooste Park, Cincinnati, consult. engr. (Correction—name and address of owner). CD 5/4.

▲ Texas—White River Water Dist., Post, dam project on White River as domestic water supply for 4 towns via Post, Crosbyton, Spur Rails, $4,000,000; water pipe conduit lines to deliver domestic water supply from dam to each of 4 towns via Post, Crosbyton, Spur Rails, $1,000,000. Freese & Nichols, 407 Daniger Bldg., Ft. Worth, consult. engrs. CD 4/25.

Tex., Bryan—City, voted bonds May 22, special concrete type water mains, $150,000; water pumping station unit, $50,000; 2nd elevated steel water storage tank, $85,000; 2 water supply wells $80,000, 8-mile water conduit, $500,000. CD 5/9.

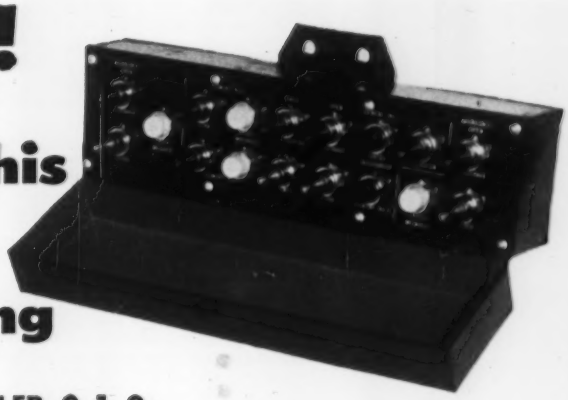
SEWERS, WASTE DISPOSAL

▲ Ala., Montgomery—City, City Hall, voted $2,270,000 bonds, storm water drainage 11 projects. CD 4/25.

(Continued on page 120)

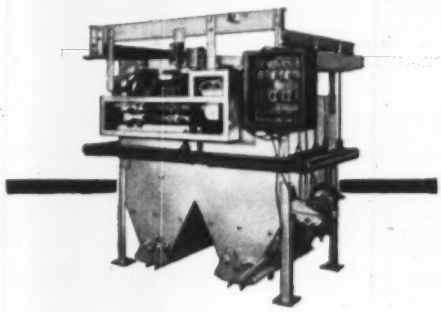
Roadbuilders!

Just this Plus this



Do ALL your batching

One Man Operated — The BUTLER 0-1-0 Roadbuilders Plant Batches Sand, Cement, 2 Sizes of Stone, Simultaneously and Automatically.



2½ batches a minute more than satisfies the hunger of two 34E dual drum pavers — yet is the production pace which the BUTLER 0-1-0 readily achieves. Only one man — stationed at the cement batcher — to touch a simple set of push buttons — operates any one, two or all three plants.

Master controls for each batcher are pre-set for any specified batch proportion. These are not touched again until the specification changes . . . Gates are completely interlocked, cannot discharge until correct weights are in the hopper and the batcher cannot be charged until the previous batch is cleared. Every batch is the same . . . no errors, no slow down through operator fatigue.

MORAL: *The BUTLER 0-1-0's labor saving, high production and remarkable portability cut your costs so sharply, you can bid any job successfully and make a better profit against any competition* (except another 0-1-0 owner).

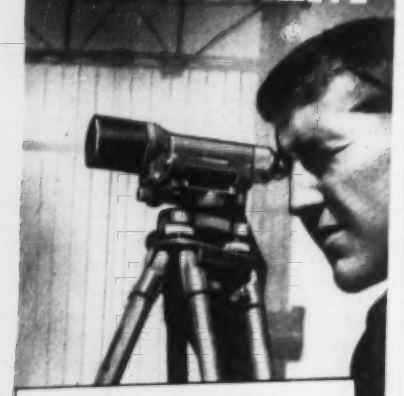
As your first step toward BUTLER 0-1-0 ownership send for this illustrated Bulletin completely describing the advantages. Get ready — now. Send for Bulletin 0-1-0 today.

BUTLER BIN COMPANY

947 BLACKSTONE AVENUE

WAUKESHA, WISCONSIN

WHERE THERE'S A
BIG JOB
THERE IS A
KERN
INSTRUMENT



WORLD FAMOUS
precision surveying instruments... compact, rugged construction... fast, effortless operation. More reliable results in less time.

KERN'S NK3
precise level
in use at Gloucester Anchorage of new Walt Whitman Bridge being constructed over Delaware River. (Modjeski & Masters, Consulting Engineers)

DESIGNED FOR
HIGHEST
PRECISION LEVELING

- **Functional, down-to-fundamentals design—only 4½ lbs. (8 lbs. with carrying case).**
- **Coincidence level and fine tilt screw.**
- **Readings at a glance—level and rod may be read simultaneously through 30x Telescope.**
- **Mean leveling accuracy under normal conditions ± .008 ft. per mile.**
- **Kern AR coated optics produce substantial increase in brilliance and contrast of image.**

Write for Brochure NK 527-1

PROMPT, RELIABLE SERVICE
FACTORY TRAINED PERSONNEL

Kern and Only Kern Offers You the Latest Designs of Dr. Henry Wild

Kern SWISS
The FINEST in SURVEYING EQUIPMENT
KERN INSTRUMENTS INC.
120 Grand St., White Plains, N.Y.

(Continued from page 118)

Conn., Rockville—City, c/o Town Council, sewage treatment plant, $700,000. Bowe Albertson & Assoc., 116 William St., New York, N. Y., consult. engrs. CD 2/13/46.

▲ Ky., Owensboro—City, City Hall, sewage treatment plant intercepting sewer primary settling tanks digestors, filters, concrete sewers. $2,450,000. Consoer, Townsend & Assoc., 351 E. Ohio St., Chicago, Ill., consult. engrs. CD 11/22/54.

▲ Mich., Harper Woods—City, Root J. McNutt, mgr., storm sewer, central area. $1,965,000. Pate & Hirn, 532 Mich. Bldg., Detroit, consult. engrs.

▲ O., Bexley—City, sewage disposal plant. $1,000,000. Jennings-Lawrence Co., 1342 King Ave., Columbus, O., consult. engr.

▲ O., Cincinnati—Bd. Comrs., Hamilton Co., Sect. A of Glenway Trunk Sewer, 141x49 concrete box, $662,891. Bids in August. Sect. B of Glenway Ave. Trunk Sewer line, $342,824. Bids late fall. Al. LeFeter & Assoc., Woodburn Ave., consult. engrs. Geo. Lemmel, c/o owner, engr. CD 11/5/54.

▲ Tex., Bryan—City voted bonds, May 22, sewage disposal plant, $200,000, sanitary sewers, $1,500,000; storm sewers, $300,000. CD 5/9.

BRIDGES

▲ ALABAMA—State Hy. Dpt., Montgomery, Jefferson-Tuscaloosa Counties—bridge over Warrior River, Birmingham-Tuscaloosa Hy. $1,000,000.

Ont., Hamilton—City, City Hall, grade separation and traffic interchange, Mountain Blvd. and Flock Rd., new pavement and widening Flock Rd. from Mountain Blvd. to Mountain Brow Blvd., traffic interchange, Mountain Brow Blvd. and Flock Rd. $850,000. W. L. McFaul, city engr. Proctor, Redfern & Laughlin, 11 Jordan St., Toronto, consult. engrs. CD 2/11/54.

▲ Que., Three Rivers—Corp. of Pont des Three Rivers, J. F. Wickenden, pres., Three Rivers,, bridge over St. Lawrence River from Three Rivers to Ste Angele. $14,000,000. Total est. $17,000,000. Dr. P. L. Pratley, 1117 St. Catharines St. W., Montreal, consult. engr.

STREETS AND ROADS

▲ CALIFORNIA—State Div. Hys., 1200 N St., Sacramento.

Glenn Co.—imprv. drainage on U. S. 99 W between 0.2 mi. south of Orland and near north city limit of Orland, 1.1 mi., $75,000. Bids in June.

Humboldt Co.—grading, surf. 2.1 mi. old Arcata Rd. from Freshwater Corners to Indianola, $116,000. Bids in 1957.

grading, surf. 2.4 mi. Freshwater Rd. from Freshwater to Freshwater Corners, $145,000. Bids in July or August.

Los Angeles Co.—protective planting 1.5 mi. Harbor Freeway, between Santa Barbara Ave. and 4 St., $105,000. Bids in June.

traffic signals, hy. lighting and channelization on Sepulveda Blvd. at 9 intersections between Gould Lane in Heromsa Beach and Rosecrans Ave. in El Segundo, $181,800. Bids in June.

Orange Co.—surf. 4.8 mi. State Sign Rte. 18, between Santiago Blvd. and Mohler Dr., $505,000. Bids in June.

Santa Cruz Co.—grading, paving, structures 1.3 mi. Sign Rte. 1, between Sign Rte. 17 and Mission St. in Santa Cruz, $160,000. Bids in June.

Shasta Co.—grading, surf. 9.7 mi. portions of Anderson-Palo Cedro Rd., $342,000. Bids in June.

Tuolumne Co.—reconstr. 3.6 mi. portion of Sonora Pass Hy. between Strawberry and Bumble Bee. Sign Rte. 108, $75,000. Bids in June.

grading, surf. 3 mi. Tuolumne-Sonora Rd. from Sign Rte. 108 3 mi. easterly of Sonora to 0.7 mi. easterly on Standard Rd., Bids in July or August, $135,000.

Ont., Hamilton—City, City Hall, enlarging improv. Kenilworth Ave. pavement from King St. to Lawrence Rd. and connecting links, $525,000. W. L. McFaul, city engr. Proctor, Redfern & Laughlin, 11 Jordan St., Toronto, consult. engrs. CD 7/3/43.

EARTHWORK, WATERWAYS

Conn., West Haven—Beach Erosion Control Comm., Town Hall, walls and revetments, Ames Point to prevent erosion. $500,000.

▲ Ontario—Hydro-Electric Power Comm. of Ontario, 620 University Ave., Toronto, hydro-power development to have 75,000 kw. capacity on English River, Kenora. $37,500,000.

AIRPORTS

Ala., Montgomery—ADMINISTRATION BLDG.—City, City Hall voted $995,000 bonds, administration bldg., Dannelly Field. CD 4/25.

LATIN AMERICA

▲ Nicaragua, Corinto—Corinto Port Auth., c/o Govt. of Nicaragua, Managua, plans port development, incl. quay, transit sheds and cargo handling equip. $3,200,000. Loan made by World Bank.

▲ Venezuela, Machiques—PLANT—Industria Lactes venzolana C.A., Edif. Atlantida, Esq. Hospital, Caracas, D.F., plans dehydrated milk plant. $2,400,000.

FOREIGN

▲ Finland—Mortgage Bank of Finland Oy, Helsinki, received $25 million World Bank loan for distribution to following companies: Kemijoki Oy, two 220,000 kw. hydro electric plants on Kemi River, Lapland. $6,200,000.

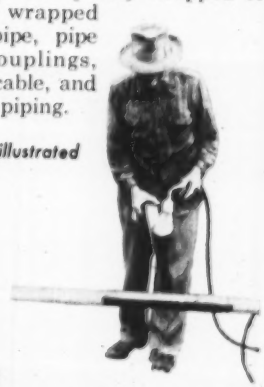
Do You Have This PIPE PROTECTION PROBLEM?

Underground piping must be protected against destructive forces of corrosive soils and electrolytic conditions. Normally, coal tar coating as called for in AWWA specifications C-203 and C-204 would be hot-applied at a coating mill. However, there are times when the volume of pipe involved or the distance of a coating mill make this impractical from a time and cost standpoint.

You'll find the ANSWER with TAPECOAT® . . . the Quality Coal Tar Coating in Tape Form

TAPECOAT is the widely-accepted alternate material that is equivalent to mill-applied hot coal tar protection. With this easy-to-use material, protection can be applied in the field by your own men, because technical know-how, kettles and special crews are not required. You save time and money while providing the long-life protection called for.

TAPECOAT is easily applied, using a torch to soften or bleed the pitch which gives both bond and protection. Available in widths from 2" to 24", it is spirally wrapped or cigarette wrapped around pipe, pipe joints, couplings, conduit, cable, and insulated piping.



Write for illustrated brochure.

The TAPECOAT® *Company*

Originators of Coal Tar Coating in Tape Form

1551 Lyons Street
Evanston, Illinois

Imatran Voima Oy, transmission lines and related works in Southern Finland, $3,800,000.
Kaukas Ab, 22,000 kw. hydro-electric plant on Pielas River at Kaltimo, $1,200,000.
City of Helsinki, 75,000 kw. thermal power plant, $2,600,000.
Pargas Kalkbergs Ab, 27,000 kw. plant on Island of Pargas (plant underway). Total cost of projects is $103 million.

PUBLIC BUILDINGS

▲ **Ala., Montgomery**—COMMUNITY CENTER—City, City Hall, voted $1,255,000 bonds, 6 community centers buildings, playgrounds, pools, etc. CD 4/25.

▲ **Ala., Montgomery**—LIBRARY, etc.—City, City Hall, voted $1,000,000 bonds, public library and museum. CD 4/25.

▲ **Calif., Atwater**—SCHOOL—Bd. Educ., Atwater, high school. $1,513,800.

▲ **Calif., Danville**—HOMES—Newhall-Scott Co., 260 Calif. St., San Francisco, 100 homes on the William Silveria Ranch property, near here. $3,000,000.

▲ **Calif., Del Paso Heights**—COLLEGE—American River Junior College District, 1333 Grand Ave., voted $2,300,000 bonds, new American River Junior College on Winding Way, near Sacramento, $5,300,000.

▲† **Calif., Sacramento**—COURT HOUSE, etc.—General Services Admin., 18 and F Sts. N.W., Wash. 25, D. C., 345,000 sq. ft. court house and federal bldg., $10,210,000, incl. site (no appropriation). Applied for Congressional approval.

Conn., Hartford—COMMUNITY—City, 550 Main St., plans by Louis Drakos, 998 Farmington Ave., West Hartford. North End Community Bldg., Garden St. $600,000. John McDowell, 226 W. 47 St., New York, N. Y., consult. engr. Winfred W. DeMay, city engr. CD 4/25.

Conn., New London—SCHOOL—City, Bd. Educ. City Hall, new Junior High School. $600,000.

▲ **Calif., Norwalk**—SCHOOLS—Norwalk Elementary School District, Norwalk, voted $2,250,000 bonds schools.

Conn., Killingly—SCHOOL—Town plans by Carl J. Malmfeldt & Assocs., 36 Pearl St., Hartford, Dayville Elementary School, 23 classrooms, auditorium and gymnasium. $700,000. Chandler & Palmer, 16 Franklin St., Norwich, consult. engrs. CD 1/26.

▲ **Conn., Storrs**—FINE ARTS, etc.—State Conn., Pub. Wks. Comr., State Office Bldg., Hartford, plans by Golden Storrs & Co., 343 Fairfield Ave., Hartford, Fine Arts, Social Science & Humanities Bldgs., $3,632,817; plans by Walter R. Furey, 1094 Enfield St., Thompsonville, Poultry Science Bldg., $1,024,843; plans by McKim, Mead & White, 101 Park Ave., New York, N. Y. Engineering Bldg., $1,500,000; plans by Fred C. Teich, 252 Asylum St., Hartford, Shipping and Receiving Warehouse Center, $615,000; plans by Robert C. May, 967 Farmington Ave., West Hartford, Junior-Senior High School, $1,600,000, above work at University of Conn. CD 1/17.

▲ **Conn., Stratford**—SCHOOL—Town, high school, north end. $2,000,000.

▲ **Conn., West Haven**—SCHOOL—Town, high school, Painter Park. $1,300,000.

Iowa, Marshalltown—SCHOOL—Bd. Educ. voted $980,000 bonds, May 21, high school expansion. Brooks-Borg, 815 Hubbell Bldg., Des Moines, archts. CD 5/2.

† **Kan., Emporia**—POST OFFICE, etc.—General Service Admin. Pub. Bldgs. Service, 2306 E. Bannister Rd., Kansas City 14, Mo., post office and federal office bldg., on lease-purchase plan, $990,000.

▲ **Mass., Boston**—HOSPITAL—City of Boston, Institution Dpt., City Hall, plans by John M. Gray Co., 175 High St., hospital for chronically ill on Long Island. $7,000,000. Hayden, Harding & Buchanan, Park Square Bldg., consult. engrs. CD 9/16/53.

Mass., Mendon—SCHOOL—Towns Mendon and Upton, c/o Percy L. Rowe, Bellingham, Junior-Senior High School. $500,000.

▲ **Mich., Detroit**—LIBERAL ARTS, etc.—University of Detroit, John R. Mulroy, vice pres., 4001 W. McNichols St., liberal arts bldg., psychology laboratories, library, etc., Campus Dr., $1,400,000, CD 4/26/54; communications art bldg., laboratories, offices, etc., $1,900,000; biology research bldg., incl. research rooms, greenhouses, etc., $500,000.

▲ **Mich., Hazel Park**—SCHOOL—City, Bd. Educ., 22750 Highland St., $8,500,000 bond election June 11, schools. Jahr-Anderson Assoc., Inc., 15011 Michigan Ave., Dearborn, archt.

▲ **Mich., Hudson**—SCHOOLS—Bd. Educ., Hudson Area School Dist., voted $1,550,000 bonds May 14, schools. H. E. Beyster Assoc., Inc., 700 Griswold Bldg., Detroit, Zone 26, archt. CD 5/9.

▲ **Mo., Kirkwood (St. Louis 22 P.O.)**—SCHOOLS—Kirkwood School Dist. R-7, Bd. Educ., Alva L. Crow, supt. Schools, 516 S. Kirkwood Rd., Zone 22, plans by Wm. B. Ittner, Inc., 408 Bd. Educ. Bldg., 911 Locust St., St. Louis, Zone 1, Junior High School, $1,000,000; plans by Jamieson, Spearl, Hammond & Grolock, 1696 Arcade Bldg., 812 Olive St., St. Louis, Zone 1, Henry Hough-Oakland School addn., 100 N. Sappington Rd., $400,000. CD 2/17.

▲ **Mo., St. Louis**—OFFICE—Bd. Educ., V. Harry Rhodes, comr. School Bldgs., 911 Locust St., Zone 1, 3 story, bsmt. office, 1500 block South Grand Blvd. $1,250,000. CD 5/31/55.

Mont., Billings—HOSPITAL—Sisters of Charity, Fort Leavenworth, Kan., plans by Cushing & Terrell, 1333 N. 27th St., 5 story, 47x126 ft., bsmt., wing addn., steel, concrete, brick, to St. Vincent Hospital, some renovation of existing bldg. $800,000.

GRATING
Open steel flooring, welded or riveted pattern, fabricated in carbon or stainless steel, aluminum, monel and alloys.
when you specify KLEMP You Cut Construction and Maintenance Costs from the start!
HEXTEEL
A steel floor armor designed to prolong the life of floors 5 times! Installed in concrete or mastic on new or existing concrete or wood floors
KLEMP METAL GRATING CORPORATION
6601 South Melvina Avenue
Chicago 38, Illinois
POrtsmouth 7-6760
KLEMP
Write for your FREE "Data and Specification Manual" today!

ENR

KLEMP METAL GRATING CORPORATION
6601 South Melvina Avenue, Chicago 38, Ill

Gentlemen:
Kindly send me a copy of your "Data and Specification Manual."

Name _____
Firm _____
Address _____
City _____ Zone _____ State _____
Phone _____

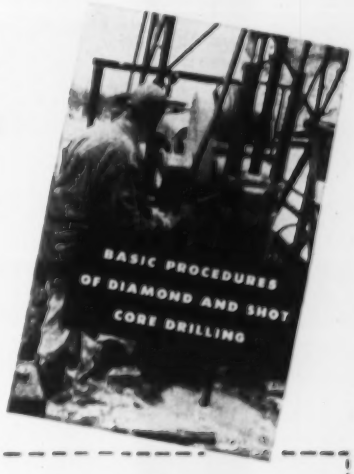
NEW

CORE DRILLING MANUAL AVAILABLE

To meet the growing need for a non-technical operational book on Core Drilling, the Acker Drill Company has prepared at considerable expense, a handy, pocket size book with over 100 illustrations.

For a fraction of the cost of preparation and printing, we'll gladly send you postpaid a copy of this new book for only $1.00. If not entirely satisfied, return the book within 7 days for complete refund.

But hurry, send the coupon, today!



ACKER DRILL CO., INC. SCRANTON 3, PA.

Here's my check for $1.00.* Rush me a copy of, "Basic Procedures Of Diamond and Shot Core Drilling."

I understand, that my money will be refunded if I am not satisfied, and the book is returned within 7 days.

NAME _____ TITLE _____
COMPANY _____
STREET _____
CITY _____ STATE _____

*Write for quantity discounts on orders of 6 books or more. ENR

BLOOD BROTHERS
Universal Joints mean DEPENDABILITY...

ON POWER WHEELBARROWS

Wherever you find 'em, you can count on Blood Brothers Universal Joints. On light or heavy equipment, they "get the power through" smoothly and dependably.

Look for them — on everything from power wheelbarrows to truck cranes. Where you see Blood Brothers Universals, you'll see a "good omen of good quality."

TRACTOR WINCHES

TRUCK CRANES

Universal Joints and Drive Line Assemblies

BLOOD BROTHERS MACHINE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
ALLEGAN, MICHIGAN

UNIVERSAL JOINTS AND DRIVE LINE ASSEMBLIES

GUNITE
Since 1915
CONCRETE
SAND AND CEMENT
"Placed by Air"

We have the equipment, personnel and experience to complete any and all GUNITE work regardless of size or location.

Send for specifications and bulletins

GUNITE CONCRETE & CONST. CO.
1301 WOODSWETHER RD., KANSAS CITY 5, MO.
2016 WEST WALNUT, CHICAGO 12, ILLINOIS
3206 HOUSTON, HOUSTON 9, TEXAS
3545 LINDELL BLVD., ST. LOUIS 3, MO.
Milwaukee and Twin Cities · Denver · New Orleans

PHOENIX BRIDGE COMPANY
Engineers—Fabricators
Erectors
Structural Steel
BRIDGES and BUILDINGS

General Office and Shops
PHOENIXVILLE, PA.
Subsidiary—Barium Steel Corporation

▲ N. J., Millburn—SCHOOL—Bd. Educ., Twp., plans by Clinton Seaman, 901 Broad St., Newark, N. J., elementary school, Hartshorne Dr. and White Oak Ridge Rd. $1,100,000.

▲ N. J., Secaucus—HOSPITAL—Hudson Co., County Courthouse, constr. Hudson Co. Mental Hospital addn. $1,800,000.

▲ N. J., South Plainfield—SCHOOL—Bd. Educ. plans by Alexander Merchant, 1 Elm Row, New Brunswick, 20 room school, Crescent Parkway, $850,000. 20 room school, Franklin Ave., South Plainfield, $825,000.

N. J., Wayne Twp. (Mountain View P.O.)—SCHOOL—Bd. Educ., Wayne Twp., plans by Emil Schmidlin, 576 Central Ave., East Orange, 15 room elementary school, 7½ acre tract north of Packanack, Wayne area. $865,000. CD 6/19/50.

▲ N. Y., Kenmore and Tonawanda—SCHOOLS—Tonawanda School Bd., Tonawanda, voted $360,000 bonds May 24, elementary school, Bering Ave., voted $1,060,000 bonds May 24, elementary school, Westchester Ave., both for Union School Dist. No. 2. CD 5/9, under N. Y., Tonawanda.

▲ N. Y., Lewiston—SCHOOLS—Niagara-Wheatfield Central School, Lewiston, voted bonds May 24, Junior-Senior High School, $4,381,000; impry. Colonial Village School, $422,000; swimming pool, $275,000. Perkins & Will, 309 W. Jackson St., Chicago, Ill., and Highland & Highland, 522 Franklin St., Buffalo, archts. CD 5/7.

▲ N. Y., Massapequa—SCHOOLS—Bd. Educ., Union Free School Dist. No. 23, Massapequa, Junior High School Merrick Rd., $3,205,000; community center, $445,000; swimming pool, $225,000. Referendum on bond issue on June 25. CD 4/2.

▲ N. Y., White Plains—SCHOOLS—Bd. Educ., 279 Hamilton Ave., completion of Church Street Elementary School, $960,000; remodeling present high school into Junior High and elementary school, $450,000; impry. school, Post Rd., $425,000; impry. Eastview Avenue School, $350,000. CD 1/21/55.

N. C., Winston-Salem—COMMUNITY CENTER—City, Tully Blair, Chmn. Bldg. Comn., drive on for funds, community center, Coliseum Dr. and N. Cherry St., $700,000.

▲ O., Columbus—DENTISTRY—State Dpt. P. Wks., State Office Bldg., S. Front St., plans by Dan A. Carmichael, 52 Long St., dentistry bldg. addn. Ohio State University Medical Center. $1,000,000.

▲ O., Elyria—COUNTY—Comrs. Lorain Co., Court House, $3,000,000 bond election Nov. 8, county bldg. Don E. Patterson, co. engr. CD 7/28/44.

▲ O., Grove City—SCHOOL—Bd. Educ., Southwest School Dist., 1390 Harrisburg Pike, Grove City, $2,500,000 bond election June 26, grade schools in Lincoln, Darydale and Grove City and high school at undetermined location.

▲ O., Jefferson—COURT HOUSE—Comrs., Ashtabula Co., Court House, plans by Fulton, Krinsky & DelaMotte, 6014 Euclid Ave., Cleveland, Zone 3, court house with jail, garage, probate court, other facilities. $3,000,000.

O., Sharonville—SCHOOLS—Princeton Local School Dist., 336 Reading Rd., $4,700,000 bond election June 8, elementary schools, Conrey and School Rds., near here, $600,000. A. M. Kinney, Inc., Vernon Pl., Cincinnati, archts. CD 4/5.

▲ Tex., Amarillo—HOSPITAL UNIT, etc.—Potter Co., Court House, plans by Hamilton Associates, c/o County Bd. Health, Court House, Amarillo, 330-bed hospital unit, $4,655,250; tunnel for traffic between buildings, $50,000; remodeling existing hospital and doctors and internes residence, $535,650; rehabilitation existing center, $429,000; health and blood center, $471,600; laying conduits for power and heating, $75,000, all foregoing part of Health Center.

▲ Tex., Beaumont—SCHOOLS—Beaumont Ind. School Dist., voted bonds May 19, Junior High School, on Northside area, $1,369,939, Junior School (Negro), $1,360,225, Lincoln Jr. School addn., 3500 Pine St., $498,062; Booker T. Washington School addns., 2800 Girolamo St., $350,000; French High School addn., 4415 Voth Rd., $459,284; auditorium, $525,000; Eugene Fields Elementary School, repairs and addns., $370,140; elementary school, north part of city, $748,310; elementary (Negro) school, on east side of city, $676,000, James Bowie Jr. High School, 3525 Cleveland St., $350,000. CD 4/23.

Tex., Kountze—SCHOOL—Chance Independent School Dist., Kountze, school. $500,000.

Tex., McAllen—CLASSROOMS—McAllen Ind. School Dist., voted bonds upper classrooms addns. (group), $500,000, lower classrooms addns., $500,000. CD 5/11.

▲ Wis., Wauwatosa—SCHOOL—Bd. Educ., 1732 Wauwatosa Ave., plans by Ebling, Plunkett & Keymar, 1220 N. Milwaukee St., Fisher Elementary School. $1,091,000.

Ont., Fort William—HOUSING—Canadian Dpt. Pub. Wks., Hunter Bldg., Ottawa, Ontario Dpt. Planning & Development, Parliament Bldgs., Toronto and City of Fort William, City Hall, housing, 52 units of four, three and two-bedroom sizes. $603,000. E. I. Stricker, c/o owner, regional constr. engr.

▲ Ont., London—SCHOOL—University of Western Ontario Bd. of Governors, Dr. Hall pres., plans by O. Roy Moore & Co., 260½ Dundas St., London, Ont., arts school, stone, steel. $1,500,000.

Ont., Toronto—SCHOOL—Richmond Hill Public School Bd., plans by Jackson, Ypes & Assocs., 5453A Yonge St., 16 classrooms, school, $350,000. Bids in mid-June.

▲ Que., Montreal—CITY HALL—City, City Hall, plans by Crevier, Lemieux & Mercier, 1065 Pratt Ave.,

(Continued on page 125)

Here's Why..

TRANSCRETES

Pour more and better concrete on any job . . easier . . faster . . at less cost for BIGGER PROFITS!

SWING-OUT HOPPER swings in for charging — swings out for discharge so concrete can come through big UNOBSTRUCTED opening in full, easily controlled stream.

EXTRA LARGE DIAMETER DRUM HEAD — DEEP "L" SECTION BLADES for faster, more thoro, more efficient mixing of any slump concrete.

TROUBLE-FREE FLOATING DRIVE that eliminates **ALL** the troubles of ordinary rigid drives. Simplest chain take-up of all — only one nut to turn.

HANDIEST, SIMPLEST CHUTE ARRANGEMENT OF ALL. Easier to handle on any kind of pour — no matter how tough the job.

A SIZE TO FIT EVERY NEED — 4 Models, 3½ to 7 yard mixing capacities. CONSTRUCTION MACHINERY CO., Waterloo, Iowa

Write for NEW, FREE

'56 TRANSCRETE Catalog

CONSTRUCTION MACHINERY CO., Waterloo, Iowa

SAVE on EXPENSIVE Pit Costs!

THURMAN portable scales . . . . . Need NO concrete pits!

Move easily from job to job! Set-up in minutes

Thurman *Portable* Truck Scales perform best in the field year after year. They're engineered to move rapidly from job to job on a moment's notice. No concrete pits are ever needed. Set on any flat level ground, ramp the earth on each end and roll trucks on. Thurman *Portables* are made for a lifetime of accuracy under rugged field conditions. Capacities: 20 to 50 ton Deck Lengths: 18 to 43 ft. Write today for bulletin 601.

EASY TO INSTALL AS A PERMANENT PITLESS SCALE saves on expensive pit cost

other THURMAN scales

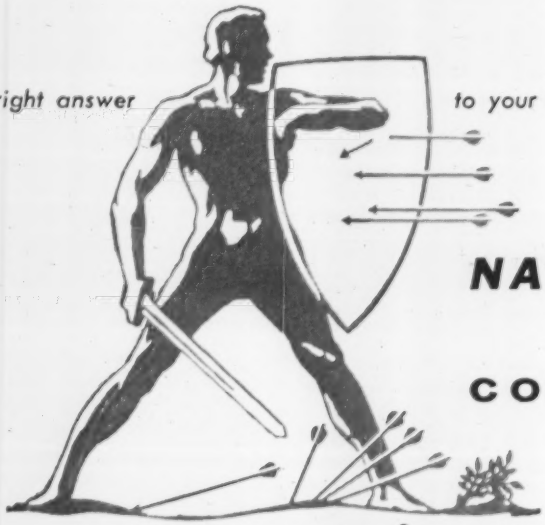
Batching Scales	Pit Scales
Liquid Weighing Scales	Warehouse Scales
Portable Truck Scales	Wheelbarrow Scales
Industrial Scales	Electronic Scales

THURMAN

Precision Products since 1918

THURMAN MACHINE COMPANY, DEPT. D, 156 N. 5th STREET, COLUMBUS, OHIO

The right answer *to your bonding problems*



INVISIBLE ARMOR®

NATIONAL SURETY
CORPORATION

CONTRACT BONDS

Available nationwide through a network of independent insurance agents and brokers

A MEMBER OF *Fireman's Fund* INSURANCE GROUP

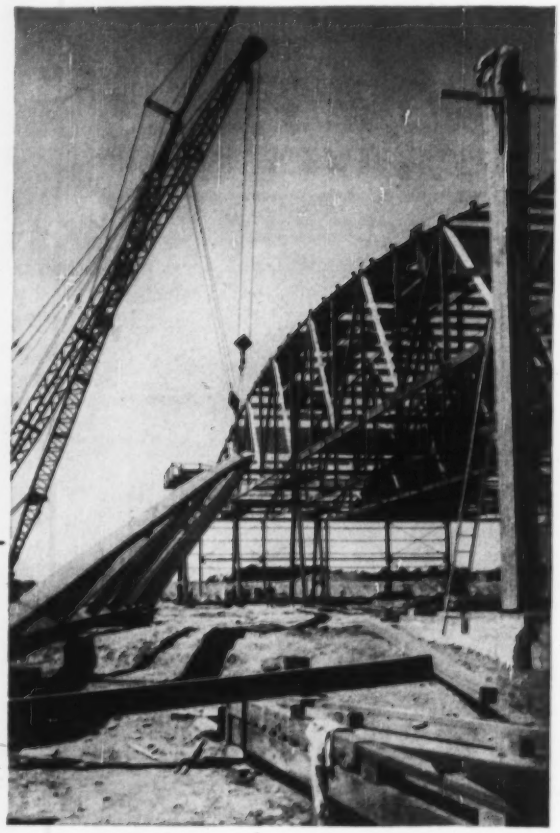
Fireman's Fund Insurance Company • National Surety Corporation
Fireman's Fund Indemnity Company • Home Fire & Marine Insurance Company
Central Bonding Offices: 401 CALIFORNIA STREET, SAN FRANCISCO • 4 ALBANY STREET, NEW YORK
Branch Offices in Principal Cities Throughout America

Timber is plentiful—timber design data, too—for planning your

WOOD ROOF TRUSSES

fabricated with TECO Wedge-Fit Connectors

TODAY! Add this Design Manual to your technical file, without cost.



TIMBER ENGINEERING COMPANY ENR-569
1319 18th Street, N.W., Washington 6, D. C.
Chicago • New Orleans • In Canada: J. E. Goodman Sales, Ltd., Toronto

Please send FREE copy of "TECO Design Manual for TECO Timber Connector Construction."

Name .....
Firm .....
Street .....
City ..... Zone ..... State .....

(Continued from page 122)

6 story city hall annex addn., $2,000,000. Lucien L'AAlier, c/o owner, ch. engr. CD 7-11.

Que., St. Zacharie—SCHOOL—La Commission Scolaire de St. Zacharie, St. Zacharie, school, $500,000.

COMMERCIAL BUILDINGS

▲ Calif., Mill Valley—HOTEL—Syndicate, c/o James Behr, 425 Miller Ave., Mill Valley, and Walter Hartman, 131 E. 66 St., New York, N. Y., hotel, $4,500,000.

▲ Calif., Orinda—TELEPHONE EXCHANGE—Pacific Tel. & Tel., 140 New Montgomery St., San Francisco, telephone (dial exchange) bldg., $1,400,000.

Calif., Sunnyvale—CHURCH, etc.—Sunnyvale Congregational Church, c/o W. E. Glessing, archt., 1040 The Alameda, San Jose, church and chapel, Educational areas with 16 classrooms, social hall and admin. office, $500,000.

▲ Conn., Bridgeport—SHOPPING CENTER—Port Operation, Inc., 19 West 44th St., New York, N. Y., plans by Jesse J. Hamblin, 1288 Main St., Bridgeport, shopping center, St. Stephens Rd., Black Rock, 800x700 ft., parking area, 860 vehicles, $2,500,000.

Conn., East Hartford—APARTMENTS—Oak Management Co., 67 Plaza Dr., 244-unit apartment development, Arnold Dr., $975,000.

Conn., Monroe—SHOPPING CENTER—Steiner, Inc., Glenridge Rd., Fairfield, shopping center, 13-store unit, incl. supermarket and branch bank, Route 111, $500,000.

▲ Ill., Chicago—ABBOTT HALL, etc.—Northwestern University, 619 N. Clark St., Evanston, plans by Holabird Root & Burgee, 180 N. Wabash Ave., Abbott Hall addn., 710 North Lake Shore Dr., $2,000,000, Wieboldt Hall addn., 339 E. Chicago Ave., $1,000,000.

▲ Ill., Park Ridge—BANK, etc.—Citizens State Bank, U. S. Northwest Hy., bank bldg. addn. and parking area, $1,000,000.

▲ Ind., Indianapolis—SHOPPING CENTER, etc.—Leo A. Lippman & Assoc., 3939 Meadows Dr., Zone 18, shopping center, E. 38th St. and Sherman Dr., 30 stores, 45 acres, parking facilities, 2,000 cars, one story buildings, laid in wide L-V shape, $2,000,000. Sidney H. Morris & Assoc., Chicago, Ill., consult. engrs.

▲ Iowa, Cedar Rapids—SCHOOL—Immaculate Conception Parish, Cedar Rapids, Catholic High School, $1,250,000. CD 8/25.

Md., Bethesda—BUILDING—Johns Hopkins University, Charles and 34 Sts., Baltimore, Zone 18, bldg. for Johns Hopkins Research Dpt., on 15 acre plot, at Wisconsin Ave. and Cedar Lane, $600,000.

▲ Mass., Boston—COLLEGE, etc.—Franco-American Oblate Fathers, Inc., 216 Nesmith St., Lowell, Oblate College and Seminary, $1,000,000.

▲ Mo., St. Louis County—SCHOOL—St. Louis Archdiocese of Catholic Church, Bldg. Comm., Rev. James R. Harnett, exec. secy., 3810 Lindell Blvd., St. Louis, Zone 8, plans by Hellmuth, Obata & Kassabaum, 315 N. 10 St., St. Louis, Zone 1, St. Thomas of Aquinas High School on 13 acre tract northside of Lindbergh Blvd. at intersection with San Fernando Hills subdivision, $1,500,000. Bids about Aug. 15. CD 5/25/54.

▲ N. J., Fort Dix—HOUSING—U. S. Eng., 2635 Abbottsford Rd., Phila., Pa., plans by S. J. Kessler & Sons, 551 Fifth Ave., New York 17, N. Y. construct and finance 702 units of Capehart housing, $8,500,000.

▲ N. Y., Brooklyn—APARTMENT—Archmont Constr. Corp., 16 Court St., Zone 2, plans by Irving Seelig, 153 Pierrepont St., Zone 2, two 6 story apartments, Theriot Ave. and Archer St., $1,700,000.

▲ N. Y., Buffalo—MEDICAL CENTER—Bernard G. King, c/o Backus, Crane & Love, archts., 232 Delaware Ave., 5 story medical center, 1275 Delaware Ave. adjacent to Millard Fillmore Hospital, $1,300,000. CD 4/23/48.

▲ N. Y., Ithaca—RESEARCH LIBRARY—Cornell University, Ithaca, research library, $4,500,000.

▲ N. Y., New York—OFFICE—Argeal Corp., 15 Broad St., plans by Carson & Lundin, 50 Rockefeller Plaza, Zone 20, 13 story office, 113-33 Maiden Lane, $4,450,000.

▲ O., Mayfield—HOMES—Gerome & Capretta, Inc., 4151 Mayfield Rd., Cleveland, Zone 21, plans by John Terlep, 28549 Harvard Rd., Cleveland, Zone 22, one hundred 1½ story, ranch-type homes, $2,500,000. Constr. in July-August.

▲ Ore., Portland—HOTEL—Sheraton Corp., 212 Wood St., Pittsburgh, Pa., hotel, $6,500,000.

▲ Pa., Phila.—HOSPITAL—Penna. Hospital for Mental & Nervous Diseases, 111 N. 49th St., hospital, $1,000,000.

▲ Tex., Austin—SHOPPING CENTER—Gulfgate Shopping City, c/o Theo. W. Berensen & Assocs., Bankers Mortgage Bldg., Houston, shopping center, $1,500,000.

▲ Tex., Beaumont—SHOPPING CENTER—Gulfgate Shopping City, c/o Theo. W. Berensen & Assocs., Bankers Mortgage Bldg., Houston, shopping center, $1,500,000.

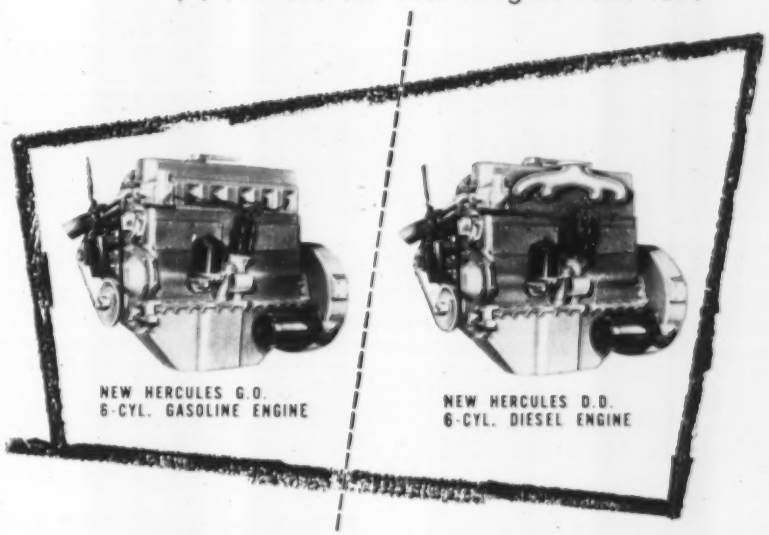
▲ Tex., Beaumont—SHOPPING CENTER—Ben Rogers Interests, c/o 1317 Austin St., Houston, 45-store unit shopping center, N. 11 St., north of U.S. Hy. 90 traffic circle, $1,500,000.

▲ Tex., Ft. Worth—DOCTORS'—Doctors' Bldg., c/o Tarrant County Medical Society, 3855 Tulsa Way, doctors' bldg., $2,000,000.

Tex., Houston—CHURCH—First Baptist Church, 1020 Lamar, plans by J. W. Dehnert, 3815 Garrott, church addn., $600,000-$800,000. Dale S. Cooper & Assoc.

WHEN YOU BUY AN ENGINE

. . . what's the first thing to look for?



Of course, some people look at the "outside" of an engine and see only a nice shiny paint-job. But that's not too important. Other buyers look at what's "inside" an engine. That can be very important. However, we think a buyer should also look at what's "back of" an engine. That's why we at Hercules Motors Corporation guard the enviable reputation we have earned in more than 41 years of engine building experience.

Hercules' reputation isn't merely a way of doing business or just the top quality of our product. We feel that our reputation means more than good business ethics and a quality product. Our reputation also means supplying new and better engines to meet the various needs of our customers.

As an example, our new line of INTERCHANGEABLE engines gives the customer the choice of gasoline or diesel power without changing engine mountings in the end product. These new G.O. (Gasoline Overhead valve) and D.D. (Direct injection Diesel) engines, not only have the same mounting dimensions in engines of the same number of cylinders, but many component parts are also interchangeable over the entire range of these new models.

Years of engine building "know how" stand "back of" every Hercules Engine. In addition, our wide selection of more than 90 models of engines and power units, available for operation on gasoline, diesel fuel, natural gas, L.P.G. and kerosene, provides a dependable source of power for all requirements between 3 and 500 H.P.

For help in solving your power problems, contact our factory. Our sales-engineers will be glad to assist you. No obligation, of course.

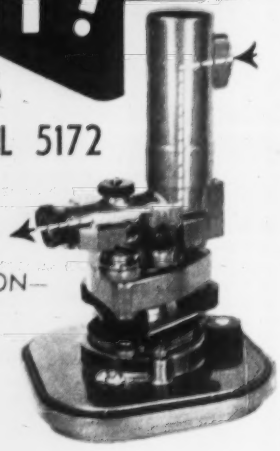
HERCULES MOTORS CORPORATION

CANTON 2, OHIO

THIS IS IT!

F/S MODEL 5172

HIGH PRECISION— LOW COST— NEW



AUTOMATIC LEVEL

Now you can get a reliable precision instrument which, actually automatically levels itself, quickly, simply, easily—no complicated time-wasting adjustments . . . at an astonishingly low price!

• THE AUTOMATIC LEVEL F/S 5172 OFFERS YOU

24X Periscopic telescope containing a "pendulum-principle" device which automatically produces and maintains a horizontal line of sight.

Direct view of the spherical bubble through the telescope eyepiece, allowing constant check on the bubble centering while reading rod.

• THE AUTOMATIC LEVEL F/S 5172 GIVES YOU PRECISION ACCURACY

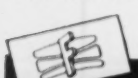
±0.028 ft./mile if used with regular base; ±0.010 ft./mile if used with special up-down movable base (micrometer Mod. 4180) graduated to 1/1,000 ft. or to 1/10 mm.

• THE AUTOMATIC LEVEL F/S 5172 COSTS YOU ONLY

$350 including adjustable leg tripod

$90 for the optional micrometer Mod. 4180

GUARANTEED 18 MONTHS
FULL SERVICING BY FACTORY SPECIALISTS



Send for further information and name of nearest dealer

FILOTECNICA SALMOIRAGHI INC.

41-14 24TH STREET, LONG ISLAND CITY 1, N. Y.

3815 Gravois St., and Jas. I. Stillman, 1510 Barlee, consult. engrs. CD 7/3/52.

▲ Tex., San Antonio—SHOPPING CENTER—Gulfgate Shopping City, c/o Theo. W. Berensen & Assocs., Bankers Mortgage Bldg., Houston. Shopping Center No. 1, $2,500,000; Shopping Center No. 2, $1,000,000.

▲ Tex., Seagoville—SHOPPING CENTER—Tex. Putnam & T. A. Jacobs, Seagoville, 116,790 sq. ft., masonry, shopping center, 20 acre site on US Hy. 175, $2,000,000.

B. C., Nanaimo—MOTEL—St. Paul Motels Ltd., c/o 2120 Alberni St., Vancouver, plans by Gardiner, Thornton, Gathe & Assocs., 1520 Alberni St., 4 story, reinforced concrete motel bldg., $600,000.

Que., Alma—HOSPITAL—Hospitalieres de la Misericorde de Jesus, Alma, plans by Pierre Rinfret, 1134 St. Louis Rd., Sillery, 50 bed hospital addn. $500,000.

▲ Que., Joliette—MENTAL HOSPITAL—St. Charles de Joliette Hospital Corp., c/o Quebec Health Dept., Parliament Bldgs., Quebec City, plans by Pierre Rinfret, 1134 St. Louis Rd., Sillery, 8 and 9 story 4 wings mental hospital, $15,000,000. Desjardieres & Mercier, 306 St. Catherine St. W., Montreal, consult. engrs. CD 5/23.

▲ Que., Montreal—BIOLOGY, etc.—Bd. Governors, McGill University, Montreal, modernization of biology bldg., arts bldg. exten., $1,500,000; Purvis Hall residence wing, $850,000; medical bldg., $1,650,000; addition to residence on Macdonald College Campus, $500,000, all McGill University. CD 12/1/48.

▲ Que., Montreal—OFFICE WING—Dorchester Tower Corp., 1390 Sherbrooke St. W., plans by Reuben Fisher, 5177 St. Sulpice Rd., Montreal; H. T. Fisher & Assocs., 230 Park Ave. and Power & Kessler, 230 Park Ave., both New York, N. Y., 14 story, 13,000 sq. ft. west wing of office bldg. Over $1,000,000. Henry S. Backler, 5253 Decarie Blvd., consult. engr. Bids in August.

INDUSTRIAL BUILDINGS

▲ Calif., Los Angeles—PLANT—Young's Market Co., 4900 S. Alameda St., meat-mayonnaise plant, 150,000 sq. ft. wing warehouse, offices, $1,500,000. To go ahead in 90-days.

▲ Colorado—STEAM GENERATING PLANT—Tri-State Generation & Transmission Assoc., Inc., Sterling, steam generating plant of two 22,000 kw units and 20 mi. 115 kv transmission line, $9,968,000.

▲ Conn., Windsor Locks—MANUFACTURING—Hamilton Standard Div., United Aircraft Corp., Bradley Field, plans by Fairbrother & Mienis, 345 New Center Bldg., Detroit, Mich., 1 story, 210,000 sq. ft. mfg. bldg., at rear of existing bldg. $2,500,000. Bids soon.

▲ Ind., Hammond—OFFICES, etc.—Standard Oil of Indiana, Hammond, offices and laboratory, $1,000,000. Summer Schlitt Co., 307 N. Mich. Ave., Chicago, Ill., consult. engr.

▲ Ind., Mishawaka—FACTORY—Rockwell-Spring & Axle Co., Mishawaka, about 6 acres, factory structural steel, steel metal deck roof, brick and metal siding, outside stair. Over $1,500,000. Patterson, Emerson & Comstock, 313 E. Carson, Pittsburgh, Pa., consult. engrs.

▲ O., Cleveland—COKE OVENS—Republic Steel Corp., Republic Bldg., Zone 15, rebuilding 204 coke ovens at Cleveland Works, $20,000,000.

O., Independence—PLANT—Big Four Lumber Co., 7555 Bessemer Ave., Cleveland, Zone 27, plant on 8 acre site west of Willow Cloverleaf, incl. storage yards, office bldg., trim shop, planing mill, etc. Over $500,000.

▲ Tenn., Chattanooga—FOUNDRY—The Wheland Co., Signal Mountain Blvd., mechanized foundry, addn. machinery, etc. $3,500,000.

▲ Tex., Bryan—POWER PLANT—City, voted bonds addnl. improv. and expansion to electric power plant, $2,885,000. CD 5/9.

▲ Ont., London—PLANT, etc.—Canadian Westinghouse Co., Ltd., 286 Stanford Ave., plans by P. H. Laponite, 1534 Cote des Neiges Road, Montreal, Que., distribution transformer plant, Clarke Sideroad area, and office space, $20,000,000-$30,000,000.

UNCLASSIFIED

▲ California and Arizona—NATURAL GAS PIPE LINE—Southern Counties Gas Co. of California, and Southern California Gas Co., 810 S. Flower St., Los Angeles, Calif., 236 mi. 30 in. natural gas pipe line from Toprock, Ariz. to Newhall, Calif., $27,000,000. Work to start in November; 49 mi. extension from Newhall into Los Angeles area, $7,500,000. Work to start in June.

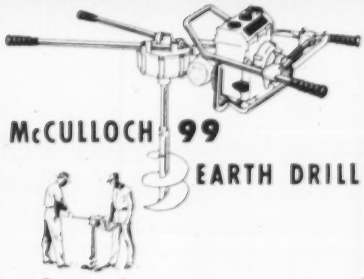
Florida—RURAL DISTRIBUTION LINES, etc.—Florida Keys Electric Co-operative Assoc., Travernier, 25 mi. rural distr. lines and complete previously approved transmission facilities, Monroe Co. $625,000. CD 9/11/52.

▲ Nebraska—NATURAL GAS LINE—Northern Natural Gas Co., 2223 Dodge St., Omaha, 24 in. natural gas line, vicinity of Palmyra and Hooper, $1,400,000. Byron Francis, c/c owners, ch. eng. CD 10/9/52.

Neb., Omaha—TOWER, etc.—Harold Corp. (K.E.T.V.), 15th and Dodge Sts., plans by D. U. Boyer, 1504 Dodge St., 1 story, 142x245 ft. television station bldg., 500 ft. tower, 27th and Douglas Sts. $500,000. Nance-Rossie & Assoc., 2524 Dodge St., consult. engrs. CD 12/16/53.

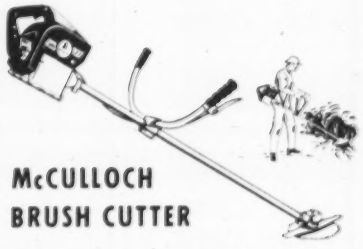
▲ Alberta and Ontario—GAS PIPE LINE—Trans-Canada Pipe Lines Ltd., Calgary, Alta., constr. Prairie part of 2,500 mi. natural gas pipe line, Alberta to Lakehead, Ont. $80,000,000.

NEW gasoline-powered tools for **CONTRACTORS**



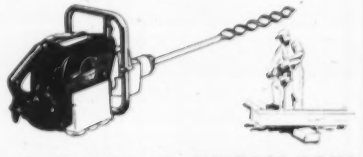
McCULLOCH 99 EARTH DRILL

- Digs post holes quickly at any angle, in any terrain, in any soil
- Drills vertically—bores horizontally
- Digs soil-test samples conveniently
- Opens gate and other gear-driven valves
- Converts into heavy-duty chain saw for cutting timber
- Will reverse direction of rotation
- Available with choice of augers
- Exceptionally powerful and light in weight



McCULLOCH BRUSH CUTTER

High-speed, light-weight tool saves time cutting brush. Easily operated by one man. Converts into one-man chain saw, or drill shown below.



McCULLOCH ALL-PURPOSE DRILL

For stump blasting, linework, bridge work, and other construction; also drills rock and soil and works with Jacobs chuck. Converts into one-man chain saw, or brush cutter shown above.

SEND FOR FREE LITERATURE AND NAME OF NEAREST DEALER

McCULLOCH

McCulloch Motors Corporation
6117 W. Century Blvd.
Los Angeles 45, California

World's largest chain saw builder
Nationwide sales & service

This rope can take it!

MONARCH WHYTE STRAND WIRE ROPE BY MACWHYTE

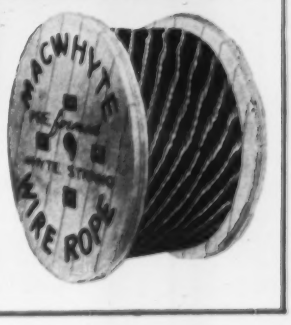
Wherever you put wire rope to work, you need rope designed and made to earn its way on your toughest requirements, under severest service conditions.

To provide you with exactly the *right* rope for each requirement, MONARCH WHYTE STRAND is made in every wire rope classification, PREformed and Internally Lubricated, Lang Lay or Regular Lay, with Fiber Core or Independent Wire Rope Core.

Put MONARCH WHYTE STRAND to the test on your equipment, you will be more than pleased with its performance.

Prices, literature, and catalog available through any Macwhyte distributor; or write direct. Ask for Special recommendations Booklet 5325.

MACWHYTE WIRE ROPE



Macwhyte Company, 2930 Fourteenth Avenue, Kenosha, Wisconsin

Ask for MONARCH WHYTE STRAND Bulletin 5425

Manufacturers of: Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies.

MILL DEPOTS:

New York 4, 35 Water St.
Pittsburgh 19, 704 Second Ave.
Chicago 6, 228 So. Des Plaines St.
St. Paul 14, 2356 Hampden Ave.
Ft. Worth 1, P.O. Box 605
Portland 9, 1603 N.W. 14th Ave.
Seattle 4, 87 Holgate St.
San Francisco 7, 188 King St.
Los Angeles 21, 2035 Sacramento

Distributors conveniently located throughout the United States

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 18 Connecticut

STREETS AND ROADS

June 19 Massachusetts — June 25 Connecticut

BUILDINGS—BA

▲† **Mass., Ayer**—BATTALION HEADQUARTERS—BA On Or About 6/26—U. S. Eng., 150 Causeway St., Boston; Zone 14, battalion headquarters bldgs., barracks, Fort Devens, ENG-19-016-56-185, $2,000,000-$2,500,000. Plans deposit $25. CD 6/5.

BUILDINGS—LB & CA

▲ **Stone & Webster Engineering Corp.**, 49 Federal St., Boston, Mass. CA Est. **$34,500,000**. ATOMIC ELECTRIC PLANT, Rowe, MASSACHUSETTS. Yankee Atomic Electric Co., 441 Stuart St., Boston, Mass. Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa., engrs. CD 4/15/55.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

June 19 Maryland

BUILDINGS—BA

▲ **Pa., Phila.**—OFFICE—BA 6/20—General State Auth., 18 and Herr Sts., Harrisburg, state office, Broad and Spring Garden Sts. $8,000,000. Plans deposit $100, Extended date. Collaborating Architects (Carroll, Grisdale & Van Alen, Harbeson, Hough, Livingston & Larson, and Nolen & Swinburne), 1621 Chestnut St., Zone 3, archts. CD 5/11.

HEAVY CONSTRUCTION—LB & CA

▲ **N. Y., NEW YORK**—John W. Johnson, supt., State Dpt. P. Wks., Gov. Alfred E. Smith State Office Bldg., Albany, N. Y.—**The Conduit & Foundation Corp.**, Philadelphia, Pa., LB **$9,343,405**, est. $9,520,000 (4 bidders) constr. 1 mi. sect. of Cross Bronx Expressway between Fulton and Longfellow Aves. and 1.84 mi. of access and service roads, Bronx Co.

N. Y.—No bids received 6/7/56. Est. **$335,000** reconstr. 0.48 mi. sect. of Rte. 28 in village of Margaretville, **Delaware Co.**

▲ **N. Y., NEW YORK**—John W. Johnson, supt., State Dpt. P. Wks., Gov. Alfred E. Smith State Office Bldg., Albany, N. Y.—**Callanan Road Improvement Co.**, South Bethlehem, N. Y., LB **$223,600**, est. $251,000 (5 bidders) resurf. 6.43 mi. sect. of Rte. 9 starting 1.2 mi. south of Latham Traffic Circle and exten. northward to Crescent Bridge exclud. traffic circle, Albany Co.

N. Y.—No bids received 6/7/56. Est. **$324,000** landscaping work along 7.33 mi. sect. of Major Deegan Expressway between 138 St. and Westchester Co. line, Bronx Co.

N. Y.—**Rusciano Construction Corp. & Del Balso Construction Corp.**, 20 Pelham Parkway, Pelham Manor, N. Y., LB **$4,177,950**, est. $4,512,000 (2 bidders) constr. 0.91 mi. sect. of New England Thruway Connection between Hutchinson River Parkway and Westchester Ave. in vicinity of Bronx-Pelham Parkway and 3.59 mi. of access roads, Bronx Co.

N. Y.—**John Arborio, Inc.**, West Cedar St., Poughkeepsie, N. Y., LB **$73,605**, est. $80,000 (5 bidders) resurf. 6 sects. of Taconic State Parkway totaling 3.49 mi. between Arthursburg and county line, Dutchess Co.

N. Y.—**Sheridan Construction Corp.**, 3580 Sheridan Dr., Buffalo 21, N. Y., LB **$424,932**, est. $546,000 (6 bidders) resurf. 6.83 mi. sect. of Sheridan Dr. (Rte. 324) from Niagara Falls Blvd. eastward to Transit Rd., Erie Co.

N. Y.—**Robert C. Kramer**, Holland, N. Y., LB **$295,437**, est. $361,000 (6 bidders) resurf. 2.03 mi. portion of Rte. 20 and 130 in village of Depew and 2.4 mi. sect. of Rte. 33 just outside the Buffalo City limits between Pine Ridge Rd. and county road 245, Erie Co.

N. Y.—**Sheridan Construction Corp.**, 3580 Sheridan Dr., Buffalo 21, N. Y., LB **$274,482**, est. $354,000 (10 bidders) resurf. 3.13 mi. sect. of Main St. (Rte. 5) starting at Buffalo City line and exten. eastward to Williamsville village line, Erie Co.

N. Y.—**Rock Construction Corp.**, Kingston, N. Y., LB **$757,886**, Est. $815,000. (3 bidders) reconstr. 3.98 mi. Rte. 214 starting near Ulster-Green Co. line and exten. northeastward to Edgewood, Green and Ulster Counties.

N. Y.—**Ador & Booth, Inc.**, 1130 Water St., Watertown, N. Y., LB **$308,452**. Est. $353,000. (3 bidders) constr. 0.86 mi. sect. of Watertown's Bradley St. arterial Rte. (Rte. 12) starting at West Main St. and exten. northward to city line, Jefferson Co.

N. Y.—**Howes & Farrell, Inc.**, Box 85, Oneida, N. Y., LB **$416,411**. Est. $450,000. (3 bidders) constr. 1.04 mi. portion of Oneida's North-South arterial connection (Rte. 46) starting just south of Madison-Oneida Co. line and exten. northward on new location to Fox St. in Durhamville, Madison and Oneida Counties.

N. Y.—**L. B. Strandberg & Son, Co., Inc.**, 608 South Dearborn St., Chicago, Ill., LB **$2,926,817**. Est. $2,939,000. (2 bidders) constr. 0.54 mi. sect. of Rochester's Inner Loop Arterial Rte. between South St. and George St. and 2.04 mi. of access roads, Monroe Co.

N. Y.—**Hendrickson Bros., Inc.**, 63 North Central Ave., Valley Stream, N. Y., LB **$3,484,800**. Est. $4,145,000. (1 bidder) wid'n. reconstr. work 6.2 mi. of Rte. 24 from Meadowbrook State Parkway eastward to Bethpage State Parkway near Farmingdale's west village line, Nassau Co.

N. Y.—**Hendrickson Bros., Inc.**, 63 North Central Ave., Valley Stream, N. Y., LB **$3,784,005**. Est. $4,875,000. (3 bidders) wid'n. reconstr. work of 4.78 mi. of Southern State Parkway between Wantaugh Ave. and Broadway (Rte. 110) north of Amityville and 3.92 mi. of access roads, Nassau and Suffolk Counties.

N. Y.—**D. W. Winkelman Co., Inc.**, 205 Harrison St., Syracuse, N. Y. LB **$4,474,259**. Est. $4,527,000. (1 bidder) constr. 1.2 mi. portion of Utica's north-south arterial route between Oriskany St. and Riverside Dr. and 0.55 mi. of access roads, Oneida Co.

N. Y.—**George M. Brewster & Son, Inc.**, Bogota, N. J., LB **$6,251,916**. Est. $7,371,000. (12 bidders) constr. four-lane divided Rte. 17 expressway from 2 mi. east of Wurtsboro southeastward to Fair Oaks, involving 6.63 mi. of Expressway and 4.44 mi. access roads, Orange and Sullivan Counties.

N. Y.—**Fitzgerald Bros. Const. Co.**, Rm. 405, Proctor Bldg., 92-4th St., Troy, N. Y., LB **$123,364**. Est $135,000 (2 bidders) resurf. Rte. 2 starting in Quackenkill about 6 mi. east of Troy, exten. eastward through Grafton toward Petersburg for 3.93 mi., Rensselaer Co.

N. Y.—**Central N. Y. Contracting Co., Inc.**, 505 Loew Theatre Bldg., Syracuse, N. Y., LB **$192,945**. Est. $237,000 (9 bidders) resurf. 5.25 mi. Rte. 89 in town of Ulysses south of Taughannock Falls State Park, northwest of Ithaca, Tompkins Co.

N. Y.—**Central N. Y. Contracting Co., Inc.**, 505 Loew Theatre Bldg., Syracuse, N. Y., LB **$195,840**. Est. $233,000. (6 bidders) resurf. 5.83 mi. of Rte. 96B between Ithaca and Danby, Tompkins Co.

N. Y.—No bids received 6/7/56. Est. **$10,000**. constr. concrete sidewalks and curbs along on 0.18 mi. sect. of Rte. 9W in West Haverstraw, Rockland Co.

BUILDINGS—LB & CA

▲ **Driscoll-Moccia Constr. Co.**, 41 E. 42 St., New York 17, N. Y. LB **$6,647,664** steel; **$6,642,489** foreign steel (7 bidders) general constr. for Senator Robert F. Wagner Sr. HOUSES (Proj. No. NY-5-24) Sect. II, incl. Bldgs. Nos. 14 to 22 (inclusive) located in area bounded generally by E. 124 St., First Ave., E. 120 St. and Second Ave. (but exclud. an area in southeast corner which is to be developed by Bd. Educ.), Manhattan, NEW YORK, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Bids June 5. CD 5/22;
Harry Starkman & Bros., 384 Brook Ave., New York 54, N. Y. LB **$585,420** (5 bidders) heating and ventilating work (New York, N. Y.);
Nager Electric Co., Inc., 426 Broadway, Brooklyn 11, N. Y. LB **$630,000** (10 bidders) electrical work (New York, N. Y.);
Lipsky & Rosenthal, Inc., Lexington Ave. and 115 St., New York 29, N. Y. LB **$956,000** (6 bidders) plumbing work (New York, N. Y.).

▲ **Young Builders, Inc.**, 555 Delaware Ave., Tonawanda, N. Y. Own Forces. **$17,500,000**. 1,100-1,200 HOMES 267 acre subdivision, NORTH TONAWANDA, N. Y.

▲ **John H. Wackersham**, 145 Locust St., Lancaster, Pa. CA **$1,975,000**. general constr. 1 and 3 story, steel 169,000 sq. ft. JUNIOR-SENIOR HIGH SCHOOL, MILLERSVILLE, PA. Manor Joint School Auth., Millersville, Pa. CD 5/23, under LB.

▲ **Charles H. Tompkins Co.**, 16 St. N. W., Wash., D. C., CA Est. **$2,000,000**, 5 story, bsmnt. PLANT bldg., 2 St. and Virginia Ave., S. W., WASH., D. C. Washington Star Newspaper Co., 11 and Pennsylvania Ave. N. W., Wash., D. C. Faulkner, Kingsbury & Stenhouse Ring Bldg., Wash., D. C., archts.

▲ **P. R. Roberts, Inc.**, 16 E. Lancaster Ave., Ardmore, Pa. Separate Contracts. **$3,060,000**. RESIDENTIAL DEVELOPMENT, Robert Kirkwood, Highway, etc. WILMINGTON, DEL. Anthony J. Macasluso, 322 Stanley Ave., Havertown, Pa., archt.

▲ **Walter Kidde Constructors, Inc.**, 140 Cedar St., New York 6, N. Y., CA 81,700 sq. ft. LABORATORY and OFFICE, 167-acre tract on Route 23 and Fairfield Ave., MOUNTAINSIDE, N. J. Chemway Corp., 100 Park Ave., **New York 17, N. Y.**

▲ **Arthur G. McKee & Co.**, 2300 Chester St., Cleveland, O. CA open hearth blast FURNACE to increase capacity 50 per cent at Fairless Works, MORRISVILLE, PA. United States Steel Corp., 525 Wm. Penn Pl., Pittsburgh 30, Pa.

▲ **Charles E. Smith Co.**, 1425 "H" St. N.W., Wash., D. C., Owner Builds, **$2,500,000**. 8 story, masonry concrete APARTMENT, incl. 218 units, 4501 Connecticut Ave. N.W. (Albemarle Towers), WASH., D. C. Corning & Moore, 1302 18 St., Wash., D. C., archts.

▲ **Stone & Webster Constr. Co.**, 1400 N. Royal St., Alexandria, Va., CA Est. **$3,000,000** design and construct 8 story coombination POWER SUB-STATION and OFFICE BLDG., 8 and "E" Sts. N.W., WASH., D. C. Potomac Electric Power Co., 10 and E Sts. N. W., Wash., D. C. Work late this summer.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 19 North Carolina — June 20 Virginia

June 22 Florida

STREETS AND ROADS

June 19 South Carolina — June 20 Virginia

▲† **Ga., Dawsonville**—TOWERS—BA 7/3—Lockheed Aircraft Corp., Georgia Div., Marietta, Air Force Plant No. 6, constr. and erection of four 315 ft. high steel towers, incl. guy and tie cables, fittings, service platforms, railings, ladders, radar platform, man hoist, foundations, guy anchors, lighting sys., power sys. for man hoist, conduit sys., shop and field painting, furnish and install 8 hoists with necessary cables, sheaves, electrical controls and other auxiliaries for Air Force. CD 4/12, under Public Buildings.

HEAVY CONSTRUCTION—LB & CA

▲ **Blythe Bros. Co.**, 2911 Hutchinson Ave., Charlotte, N. C., LB **$696,145**, Contr. 1, 42 in. water line; LB **$4,675,000**, Contr. 2, general constr. Hoskins Filteration plant, CHARLOTTE, N. C. **City, Henry A. Yancey**, city mgr.; City Hall, Charlotte, N. C. Bids May 29. CD 5/3;
Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, Pa., LB **$180,490**, Contr. 3, elevated tank (Charlotte, N. C.);
A. Z. Price & Assocs., Inc., 206 S. Church St., Charlotte, N. C., LB **$45,185**, **Contr. 4, plumbing** (Charlotte, N. C.);
Reliance Elec. & Eng. Co., Liberty Life Bldg., Charlotte, N. C., LB **$93,546**, Contr. 5, heating, ventilating, air-conditioning (Charlotte, N. C.).

▲ **LOUISIANA**—South Louisiana Turnpike Comn., 304 Chetimaches St., Donaldsonville,
U. S. Steel Corp., American Bridge Div., 525 Penn Pl., Pittsburgh, Pa. CA **$31,998,500**. constr. six bridges for Acadian Thruway. Bids May 21, awarded May 29. CD 5/15.

▲ **Farnsworth & Chambers Co., Inc.**, 3018 Leeland St., Houston, Tex., CA **$3,288,000**, sewage treatment plant, NASHVILLE, TENN. Grand total $4,076,286. City, City Hall, Nashville, Tenn. Awarded June 1. CD 4/11, under LB;
J. E. Milam Constr. Co., 8940 1 Ave. S., Birmingham, Ala., CA $593,617, two pumping stations (Nashville, Tenn.);
Sullivan, Long & Hagerty, 2028 2nd Ave. N., Bessemer, Ala., CA **$194,669**, constr. West Nashville main and interceptor sewers (Nashville, Tenn.)

▲† **General Dynamics Corp.**, Easter Point Rd., Groton, Conn., CA **$2,888,254**, furnishings for propulsion wind tunnel, incl. 112 actuators and design, fabrication and installation of control sys. for nozzle of the supersonic circuit, Arnold Engineering Development Center, TULLAHOMA, TENN. U. S. Eng., Tullahoma, Tenn. Awarded May 30. CD 4/4, under LB.

BUILDINGS—LB & CA

▲ **Catalytic Constr. Co., 1528 Walnut St., Phila., Pa.** CA Est. $3,000,000. design and construct PLANT to produce vinyl chloride monomer, BATON ROUGE, LA. Ethyl Corp., North Baton Rouge, La. CD 12/22/52.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 19 Indiana, Wisconsin

STREETS AND ROADS

June 19 Indiana, Wisconsin — June 26, July 3 Ohio

▲ **MICHIGAN**—BA 6/21—**Mackinac Bridge Auth., 608** Prudden Bldg., Lansing,
Contr. 5 Div. A, constr. concrete deck and asph. surf. for two 23 ft. roadways, and walkways on suspension spans and truss span approaches. South approach span 5,693.5 ft. from Pier 1 to south anchorage. North approach truss span 3,609.5 ft. Pier 34 to north anchorage other lengths total 6,207 ft. incl. main span, **$2,000,000**. **Plans deposit $25 refundable,** D. B. Steinman, 117 Liberty St., New York, N. Y., engrs. CD 6/4, under LB.

▲† **Ohio**—NIKE SITES—BA 7/5—U. S. Eng., New Post Office Bldg., Pittsburgh, Pa.; NIKE Sites 21 and 34, in Richmond Heights and Warrensville, **$2,500,000** CD 8/19.

BUILDINGS—BA

▲ **Mich., Grosse Pointe**—SCHOOL—**BA 6/25—Bd. Educ.,** Grosse Pointe Public Schools, 390 St. Clair Ave., Grosse Pointe, Zone 30, Chalfonte Junior High School, Grosse Pointe Farms, $2,800,000. Plans deposit $50, refundable. Earl G. Meyer, 806 Farwell Bldg., Detroit, Zone 26, archt. CD 2/1.

BUILDINGS—SLC

▲ **Ind., Indianapolis**—HOSPITAL—**Methodist Hospital,** 16 and Capitol Ave., soon lets contract, expand hospital with new bldg. for 208 patients, air-conditioned; new wing to school of nursing for 100 nurses $3,500,000. CD 2/9/53.

HEAVY CONSTRUCTION—LB & CA

▲† **M. J. Boyle Co.**, 2480 N. Elston St., Chicago, Ill. CA $4,608,000. Lakefront Airport and Bratenahl NIKE

sites, Cleveland, Cuyahoga Co., OHIO. U. S. Eng., New Post Office Bldg., Pittsburgh, Pa. Bids May 24. Awarded May 29. CD 5/31.

BUILDINGS—LB & CA

▲ **Sam W. Emerson Co.**, 1836 Euclid Ave., Cleveland 13, O. CA Est. $5,000,000. STORE, Cedar and Warrensville Center Rds., UNIVERSITY HEIGHTS, O. May Co., Euclid Ave. at Ontario St., Cleveland 14, O. Bids May 25, awarded June 1. CD 3/27.

▲ **Turner Constr. Co.**, 105 W. Adams St., Chicago 3, Ill. CA $6,000,000. 2 additional 12 story APARTMENTS in Lake Meadows Project, CHICAGO, ILL. New York Life Insurance Co., 134 S. La Salle St., Chicago, Ill. Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., archts. CD 7/30/48.

▲ **Sorenson-Gross Constr. Co.**, Flint, Mich. CA general constr. MUNICIPAL CENTER, city hall, auditorium, police, courts bldg., public health bldg., FLINT, MICH. Total est. $4,582,304. City, Harry K. Cull, city clk., Flint, Mich. CD 6/4, under LB;
DaVanay Plumbing & Heating Co., Flint, Mich. CA mechanical work (Flint, Mich.);
Batzil Electric Co., Inc., Flint, Mich. CA electrical work (Flint, Mich.).

▲ **Darin & Armstrong, Inc.**, 2041 Fenkell St., Detroit 38, Mich. CA $2,559,718. Oak Park HIGH SCHOOL, OAK PARK, MICH. Bd. Educ., Dist. No. 3, Oak Park, Mich. CD 5/28, under LB.

WEST OF MISSISSIPPI

BUILDINGS—BA

STATE HIGHWAY LETTINGS
BRIDGES
June 21 Iowa
STREETS AND ROADS
June 21 Iowa

BUILDINGS—LB & CA

▲ **Blaw-Knox Co.**, 180 N. Wabash St., Chicago, Ill. CA vegetable-oil extraction PLANT with 31 ft. diam. Rotocel solvent extractor, MANKATO, MINN. Honeymead Products Co., Mankato, Minn.

▲ **Burton and Lee Realty Co.**, 5865 Hampton Ave., St. Louis 9, Mo. Owner Builds. $3,000,000. 600 RESIDENCES in Manchester Hills subdivision west of city limits off Manchester Rd., MANCHESTER, MO.

▲ **John J. Stokes Constr. Co.**, 1104 T & P Bldg., Fort Worth, Tex., LB $1,995,000, general constr. CONVENTION CENTER-MUNICIPAL AUDITORIUM, AUSTIN, TEX. City, City Hall, Austin, Tex. Bids June 5, CD 4/23;
Young & Pratt, P. O. Box 901, Austin, Tex., LB $444,870, mechanical constr. incl. plumbing, heating, ventilating, air-conditioning (Austin, Tex.).

▲ **Brown & Root, Inc.**, Box 3, Houston, Tex., CA $9,000,000, 125,000 kw electric POWER GENERATING PLANT, New Salem, HENDERSON, TEX. Texas Power & Light Co., Fidelity Union Life Bldg., Dallas, Tex. CD 11/21.
Temple & Assocs., Diboll, Tex., CA $92,600, railway spur track from New Salem to Reklaw in Cherokee Co., 4½ mi. long (Henderson, Tex.).

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
July 6, 21, 27, 28 California

BUILDINGS—BA

▲† **Wash., Fort Lewis**—BARRACKS—BA 6/22—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, ten 3 story rein.-con., 51,000 sq. ft. barracks, Inv. 56-204, $5,000,000. CD 1/25.

HEAVY CONSTRUCTION—LB & CA

▲ **Stone & Webster Eng. Corp.**, 49 Federal St., Boston, Mass., CA, $35,000,000. hydro-electric project, incl. 200 ft. concrete dam, 300 ft. high and 120x80 ft. power house on Upper Baker River near Concrete, WASHINGTON. Puget Sound Power & Light Co., Electric Bldg., Seattle 1, Wash. CD 8/22.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,
Charles MacClosky Co., and Crowell & Larson, 152 Geneva Pl., Covina, Calif., LB $3,236,026 est. $4,000,000 (6 bidders) grading, paving 2.8 mi. 4-lane divided freeway incl. 11 structures, San Bernardino Co. Bids June 1. CD 5/3.

▲† **Guy F. Atkinson Co.**, 10 W. Orange Ave., South San Francisco, Calif., LB $7,467,750 (10 bidders) 3,500 ft. earthfill Coyote Valley Dam, 163 ft. high, on Russian River, 7 mi. northeast of Ukiah, Mendocino Co., CIVENG-56-94, CALIFORNIA. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids June 5. CD 5/16.

▲ **Utah Constr. Co.**, 100 Bush St., San Francisco, Calif., CA, $3,734,500, dredging work from San Francisco Bay and reclaiming with same an area 1 mi. out in bay for new Oakland International Airport, Terminal Bldg., OAKLAND, CALIF. Port of Oakland, foot of Grove St., Oakland, Calif. Bids May 7, awarded June 4. CD 5/28, under LB.

BUILDINGS—LB & CA

▲ **M. J. Kuney Co.**, N 120 Ralph St., Spokane, Wash., CA Est. $3,000,000. 10 story department STORE addn. and revision of Welch Bldg., SPOKANE, WASH. Bon Marche Department Store, Main and Howard Sts., Spokane, Wash. J. Graham & Co., 1426 5 Ave., Seattle, Wash., archts. CD 2/28.

▲ **Carl N. Swensen Co., Inc.**, 1095 Stockton Ave., San Jose, Calif., LB $2,218,000. (8 bidders) 4 story CITY HALL, SAN JOSE, CALIF. City, City Hall, San Jose, Calif. Bids June 4. CD 5/16.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
June 20 Alberta June 27 British Columbia & Alberta
STREETS AND ROADS
June 20 Alberta

BUILDINGS—LB & CA

▲ **Gregoire Perrault, Inc.**, 198 St. Joseph St., Joliette, Que., CA Est. $15,000,000. 8 and 9 story, four wings in form of cross, each approx. 258 ft. frontage MENTAL HOSPITAL, JOLIETTE, QUE. St. Charles de Joliette Hospital Corp., c/o Quebec Dpt. Health, Parliament Bldgs., Quebec City, Que. Awarded May 28. CD 6/1.

ALASKA

HEAVY CONSTRUCTION—BA

▲† **Alaska, Fort Richardson**—STORAGE FACILITIES—BA 6/27—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., petroleum fuel terminal storage facilities, incl. underground diesel fuel and vehicle motor gasoline bulk storage sys. incl. four 50,000 bbl. underground tanks, tanker unloading facilities at ocean dock and pipe lines pumping equip., Inv. 56-24. $1,500,000-$2,000,000. CD 8/22/55, under Public Buildings.

PUERTO RICO

HEAVY CONSTRUCTION—LB & CA

▲† **Capitol Constr. Co.**, Box 9682, Santurce, Puerto Rico, CA $3,351,000, airfield imprvs., Roosevelt Roads, U. S. Naval Station, NBy 1414, NavDocks, Spec. No. 1414/56, PUERTO RICO, Dist. P. Wks. Office, 10th Naval Dist., U. S. Naval Station, San Juan, Puerto Rico. Bids May 1. CD 3/23.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲† **COSTA RICA**—Bureau P. Rds., Dpt. Commerce, Inter-American Hy., 18 and F Sts., N. W., Wash. 25, D. C., U. S. A.
Foster Constr. Co., San Jose, Costa Rica and **Williams Bros. Co.**, National Bank of Tulsa Bldg., Tulsa, Okla., U. S. A. LB $9,607,185 (7 bidders) approx. 56 mi. highway const. incl. one major bridge, Platanares to Ballast Pit. Proj. 75-56-4. Bids June 1. CD 4/27.

▲† **PANAMA**—Bureau P. Rds., Dpt. Commerce, Inter-American Hys., 18 and F Sts. N. W., Wash. 25, D. C., U. S. A.,
J. A. Jones Constr. Co., P. O. Box 966, Charlottte, N. C., U. S. A. CA $2,457,463 Proj. 16, Sect. 2, approx. 33 mi. grading, drainage, base course and bridges between Aguadulce and Santiago. Bids Apr. 20. CD 5/7 under LB.

FOREIGN

BUILDINGS—BA

▲ **Iraq**—HOUSING—Bids Asked—Development Bd. & Ministry of Development of Govt. of Iraq, Baghdad, housing projects; (a) Constr. SPA/6 (1956), Western Baghdad Development, Sector 4, experimental housing scheme, constr. 200 2-story houses, (b) Constr. SPA/7 (1956) constr. 1,200 houses and community facilities in Mosul, (c) Contr. SPA/8 (1956), constr. 2,000 houses and community facilities in Basrah, (d) Contr. SPA/9 (1956) Western Baghdad Development, Sectors No 8 and 13, constr. 2,400 houses and community facilities (e) Contr. SPA/10 (1956) constr. 1,000 houses and community facilities at Kirkuk, (f) Contr. SPA/11 (1956) constr. 400 houses and community facilities near Mosul for Mosul Cement Factory, (g) Contr. SPA/12 (1956) constr. 400 houses in Mosul for Mosul Sugar Plant. Doxiadis Associates, 10 E. Venizelou St., Athens, Greece or 29/2, 53, Sa'adoon, Baghdad, Iraq, consult. engrs., adv. ENR 6/14.

HEAVY CONSTRUCTION—LB & CA

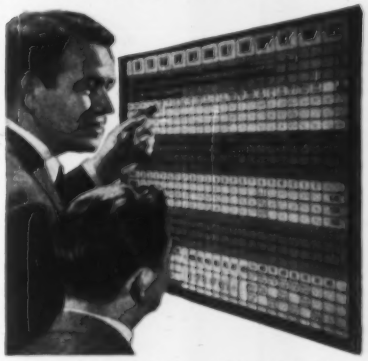
▲ **Shah Salzgitter & Jelly, Private, Ltd.**, Bombay, India, CA $16,548,000, dam, Koyna Hydro Electric project, BOMBAY, INDIA. Govt. of Bombay, Bombay, India. Bids Nov. 30, 1955. CD 7/14/55;
Patel Engineering Co., Bombay, India, CA Est. $4,832,100, conduit tunnels (Bombay, India).

BUILDINGS—LB & CA

▲ **Salzgitter Industrie Bau**, Bombay, India, CA ID $2,046,911, supply, erection and supervision of operation of complete SUGAR PLANT and RELATED POWER STATION, near Mosul, IRAQ. Development Bd., Govt. of Iraq, Baghdad, Iraq. Bids Jan. 6. CD 12/27.

(Proposal Advertisments see p. 145 to 148)

You Get Things Done With Boardmaster Visual Control



☆ Given Graphic Picture of Your Operations—Spotlighted by Color
☆ Facts at a glance—Saves Time, Saves Money, Prevents Errors
☆ Simple to operate—Type or Write on Cards, Snap in Grooves
☆ Ideal for Production, Traffic, Inventory, Scheduling, Sales, Etc.
☆ Made of Metal, Compact and Attractive. Over 60,000 in Use

Full price $49.50 with cards

FREE 24-PAGE BOOKLET NO. R-40 Without Obligation

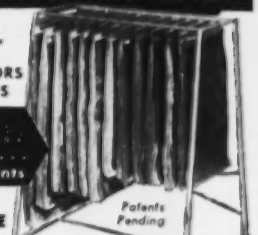
Write for Your Copy Today

GRAPHIC SYSTEMS
55 West 42nd Street • New York 36, N. Y.

Glider BLUE PRINT RACK

FOR ARCHITECTS, ENGINEERS, CONTRACTORS & FACTORIES

NOW Easy to File . . . Easy to Find . . . Your Blue Prints



20 EXCLUSIVE FEATURES, Including:

1. No holes to punch.
2. Insert sets of prints easily.
3. Replace any sheet without removing other sheets.
4. Various sizes of prints accommodated.
5. No protruding ends of clamps.
6. Each plan holder clamp holds 1 to 100 prints.
7. The "Glider" can hold 12 to 18 sets.
8. Clearly visible index shows location of sets.
9. No bolts that scratch furniture.
10. Easily adjustable tracks allow for varying thicknesses of sets.

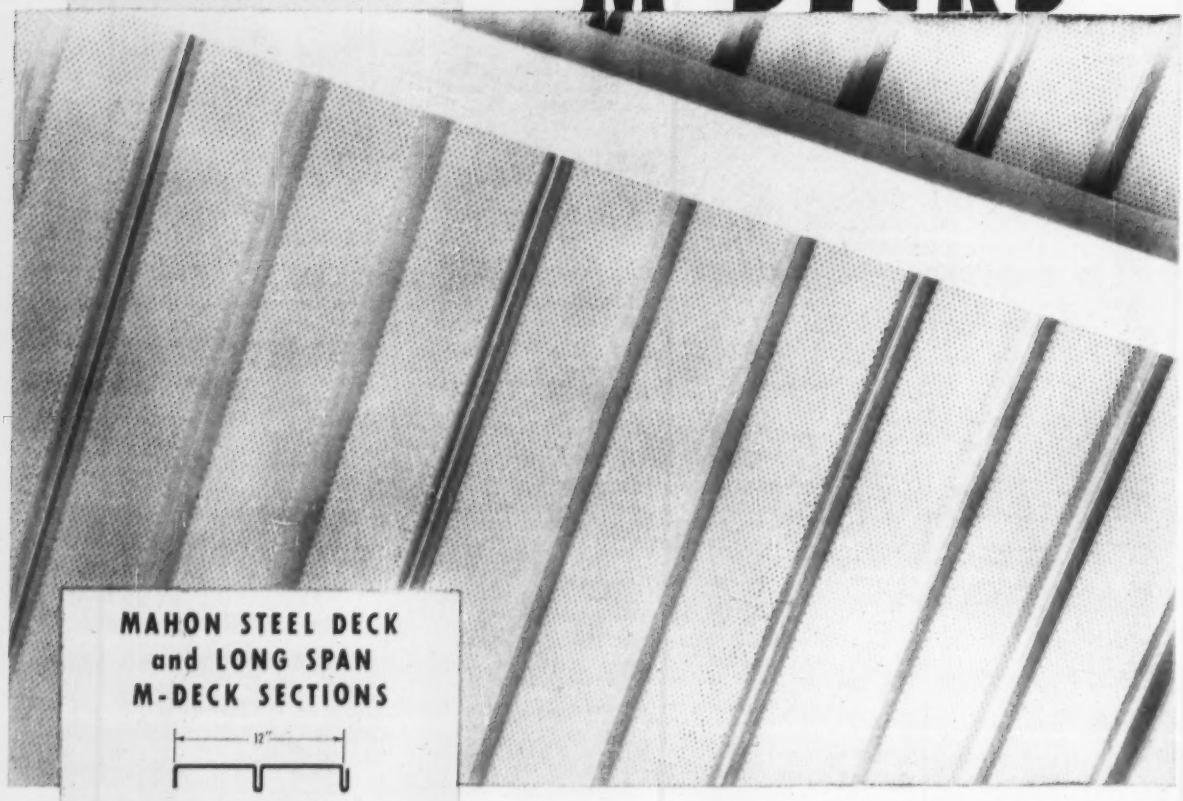
$94.50 F.O.B. Chicago INCLUDING 12 PLAN HOLDERS

ORDER TODAY OR WRITE FOR BROCHURE

MOMAR INDUSTRIES
4323 W. 32nd St. • Chicago 23, Ill.

STEEL DECK and LONG SPAN M-DECKS

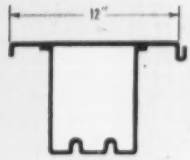
Mahon Long Span M-Deck, shown below, also provides the Acoustical Ceiling in the new Body Engineering Building, Ford Research and Engineering Center. Voorhees, Walker, Foley & Smith, Architects. Bryant & Detwiler Company, General Contractors.



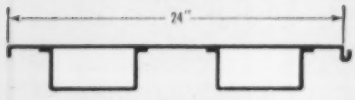
MAHON STEEL DECK and LONG SPAN M-DECK SECTIONS

STANDARD DOUBLE RIB

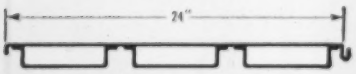
WIDE-FLANGE DOUBLE RIB



LONG SPAN M-DECK SECTION M1



LONG SPAN M-DECK SECTION M2



LONG SPAN M-DECK SECTION M3

Steel Deck is the most practical and most logical material for modern roof construction . . . it is most logical because it is lighter in weight, and because it costs less than any other type of permanent roof building material. And now that Long Span M-Decks are available in a number of structural sections that meet virtually any requirement in roof construction, as well as combined roof/ceiling construction, *STEEL*, employed as the structural unit and interior finish material as well, will roof even a broader range of building types. The illustration above shows a typical combination Long Span M-Deck Roof and Acoustical Ceiling —bottom metal of the Cel-Beams is perforated and sound absorbing material inserted to provide excellent acoustical properties. This same result can be obtained with a beamed ceiling effect, as shown, or with the Cel-Beam Section inverted, which produces a flat metal ceiling surface. Mahon Long Span M-Decks can be furnished in Cel-Beam Sections, Open Beam Sections, or Troffer Sections to span up to 32 feet. See Sweet's Files for information or write for Catalogs D-56 and M-56.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

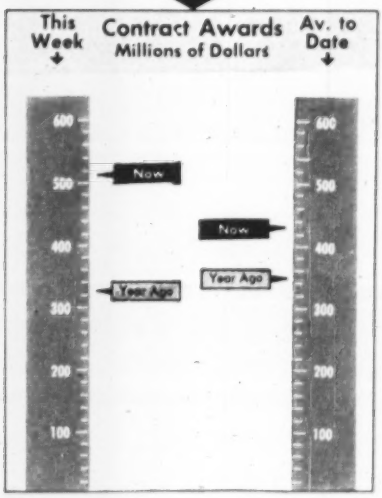
Sales-Engineering Offices in Detroit, New York and Chicago • Representatives in Principal Cities

Manufacturers of Steel Roof Deck and Long Span M-Decks; M-Floors (Electrified Cel-Beam Floor Systems); Permanent Concrete Floor Forms; Insulated Metal Walls and Wall Panels; Rolling Steel Doors, Grilles and Underwriters' Labeled Automatic Rolling Steel Fire Doors and Fire Shutters.

MAHON

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 24 wks 1956	Chge %
	$ millions		
Federal	$31.2	$831.1	+3
State and Municipal	161.1	2,939.3	+24
Total Public	192.3	3,770.4	+19
Total Private	319.6	6,733.4	+25
U. S. Total	$511.9	$10,503.8	+23
By Type of Work			
Waterworks	$12.1	$140.4	+18
Sewerage	13.3	290.5	+54
Bridges	38.4	294.8	+43
Highways	51.1	1,096.4	+17
Earthwork, Waterways	6.3	306.7	+23
Buildings:			
Public, Excl. Hosp.	46.7	921.0	+22
Public Housing	...	172.9	+30
Private Housing	102.2	2,784.6	−12
Commercial	24.0	889.8	+16
Industrial	151.1	2,702.5	+137
Unclassified	66.2	904.2	−1
U. S. Total	$511.9	$10,503.8	+23

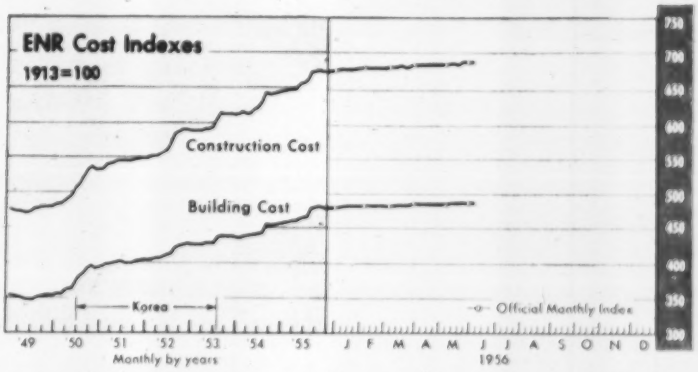
NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of June 7	Cum. 23 wks 1956	Chge '55-'56 %
	$ millions		
Corporate Securities	$34.4	$1,903.8	+23
State and Municipal:			
All Except Housing	37.4	2,064.9	+12
Housing	...	20.3	−56
Federal Loans	1.4	64.8	+25
Federal Aid	...	...	−100
Total Nonfederal	$73.2	$4,053.8	+13
Federal Appropriations:			
In U. S.	$...	$34.4	−42
Outside U. S.	...	...	...
Total New Capital	$73.2	$4,088.3	+12

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	June 7 1956	% Change from May 10 1956	% Change from June 9 1955
Construction Cost	693.17	+0.6	+5.6
Building Cost	448.89	+0.3	+5.0



CONTRACTS AWARDED

Millions of dollars	1956 May	5-Mos.	% Change from 1955* May	5-Mos.
Total U. S., ENR reported	$2,119.8	$9,741.7	−2	+23
Private	1,287.5	6,297.8	−10	+25
Public	832.3	3,443.9	+15	+20
State and Municipal	639.7	2,672.6	+21	+25
Federal	192.6	771.3	−0.4	+4
ENR Volume Index, 1913 = 100	681	723**	−4	+19

NEW CONSTRUCTION CAPITAL

Millions of dollars				
Total U. S.	$1,314.3	$4,015.1	+13	+18
State and Municipal Bond Sales	557.5	2,047.7	+36	+17
Corporate Security Sales	730.2	1,869.5	+34	+28
Federal Loans & Aid (nonfederal work)	26.6	63.4	−80	−55
Federal Appropriations (federal work)	...	34.4	−100	−43

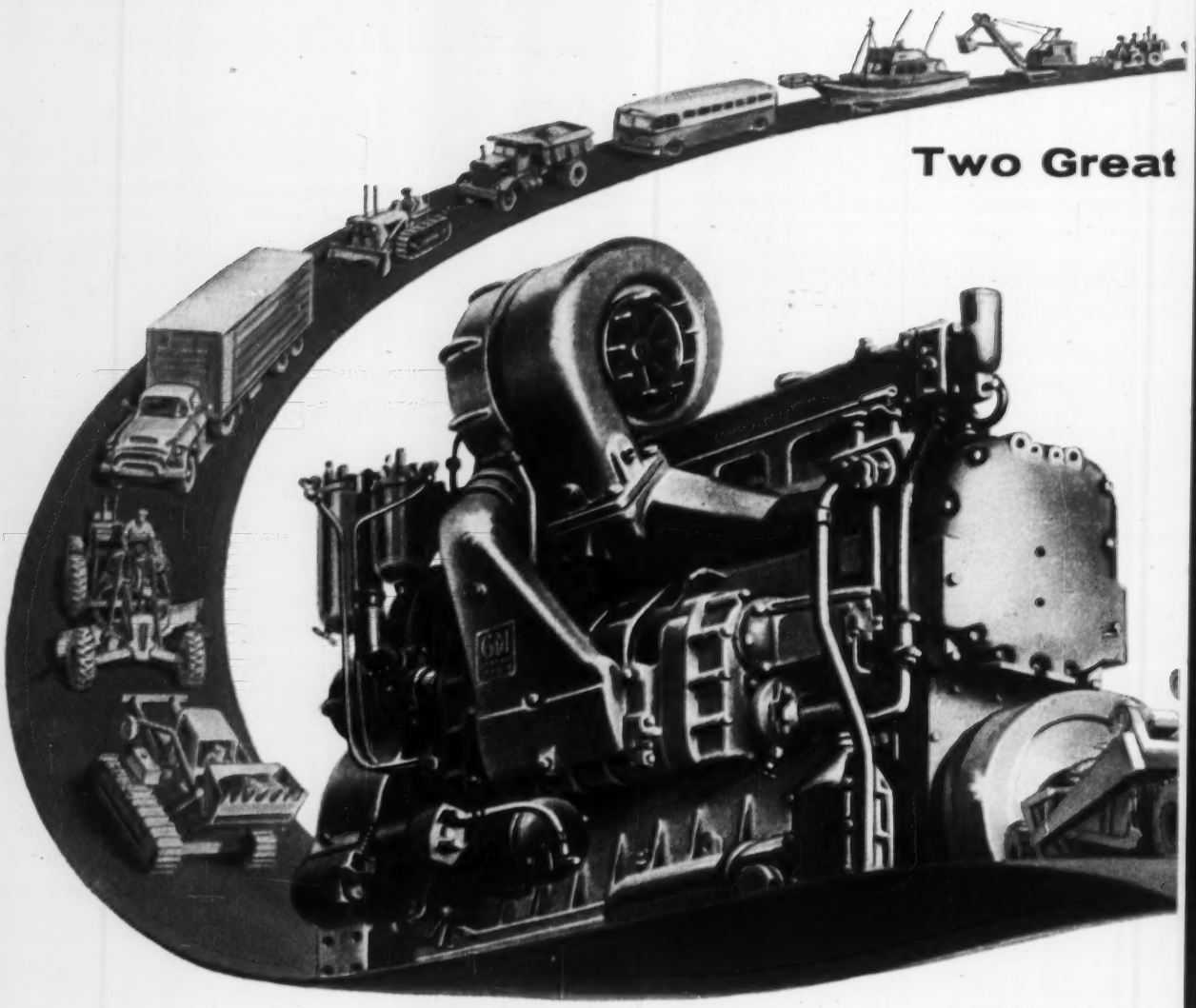
MATERIALS SHIPMENTS

Unit	1956 (F) (M) (A)	Cum. (No. of Mos.)	% Change fr. Year Ago Mo.	Cum.
Portland Cement, Bur Mines thous bbls	15,929(F)	29,202(2)	+15	+8
Concrete Paving Awards, PCA thous sq yd	7,578(A)	31,119(4)	−11	−4
Fabricated Structural Steel, thous tons	290(A)	1,133(4)	+20	+25
Bookings, AISC thous tons	379(A)	1,481(4)	+40	+44
Reinforcing Bars, Net AISI thous tons	217(M)	573(4)	+35	+41
Lumber, NLMA mil fbm	3,262(M)	9,132(3)	−6	−2
Orders mil fbm	3,291(M)	9,389(3)	−5	−1
Production mil fbm	3,084(M)	8,932(3)	−9	−2
Douglas Fir Plywood, DFPA, ⅜" basis, Production (aver. per week) mil sq ft	106.6(A)	105.1(4)	+8	+9
Orders (average per week) mil sq ft	89.5(A)	95.7(4)	−8	−3
Clay Products, Bur Census, Brick, Ungl. Common, Face mil bri	455.4(F)	890.1(2)	+12	+9
Vitrified Clay Sewer Pipe thous tons	155.0(F)	276.0(2)	+42	+32
Structural Tile, Unglazed thous tons	51.3(F)	105.6(2)	−14	−14
Asphalt Products, Bur Census, Asphalt Roofing thous sales sqs	6,157(M)	13,969(3)	+12	+12
Asphalt Siding thous sales sqs	120(M)	315(3)	−2	+9
Aluminum Products, Net, Bur Census, Sheet and Plate, Non-Heat Treatable mil lb	109.1(M)	297.8(3)	+27	+27
Wire and Cable mil lb	24.3(M)	72.7(3)	+16	+21
Extruded Shapes, Soft Alloys mil lb	59.5(M)	166.0(3)	+20	+22

EMPLOYMENT AND FAILURES

Contract Const Employ, BLS thous	2,445(A)	2,323(4)**	+2	+3
Contractor Failures, Dun & Bradstreet, Number	153(A)	570(4)	+11	+38
Liabilities thous	$6,967(A)	$30,100(4)	+8	+9

*Based on average week.
**Average per month.



Increased Power—Decreased Fuel

Here's exciting news for power users—great new 4- and 6-cylinder GM Detroit Diesel engines that represent another long forward step by the leader in the Diesel engine field. With this new, more efficient Detroit Diesel Turbopower you can have up to 17% more power with no increase in fuel consumption—or the same power output with fuel saving up to 15%.

Detroit Diesel engineers have Turbo-charged 2-cycle Diesels by combining an exhaust-driven turbine with the engine blower to deliver a larger supply of fresh air to the cylinders. Result: improved combustion, freer engine breathing, quieter and more efficient performance in the higher speed ranges.

Turbopower Diesels are additions to Detroit Diesel's time-proved Series 71 line, world's most widely used Diesel engines. The four-cylinder Turbopower Diesel delivers 171 H.P. at 2300 R.P.M.; the six-cylinder engine produces 280 H.P. at 2300 R.P.M.

To truckers Turbopower means speedier, more economical movement of big payloads.

To boatmen it means faster speed or longer cruising range—more room for cargo.

To contractors and other industrial users it means greater work output from higher-powered engines or improved economy.

For the full story of 2-cycle Turbopower, write us or call your nearest GM Detroit Diesel Distributor or Dealer.

AMERICA'S LARGEST BUILDER OF DIESEL ENGINES

New Engines Added

to General Motors 2-cycle Diesel Line

Detroit Diesel Turbopower

DETROIT DIESEL

Engine Division
of General Motors
Detroit 28, Michigan

In Canada
GENERAL MOTORS DIESEL LIMITED
London, Ontario

Let's talk 'SKIN PROTECTION'

Think what happens to your scaffolding on an everyday job and you'll realize it, too, has a "skin protection" problem. It gets battered, dented, scratched, and then rained on—and when that happens, it gets rusted—*IF* you're not using new dichromate galvanized Ezebilt. When it gets rusty like the section at right, it takes your crews a lot longer to set up and dismantle—and that's lost profit! Universal's new dichromate galvanizing eliminates all rust problems with an *extra* protection that goes on every single component. Further, this coating gives a lastingly smooth surface that lets the parts assemble faster, and makes the scaffold look better on the job (because of its gold color). And best part is that it doesn't cost any more!

Universal has a brand new catalog . . .

It tells the whole story about dichromate galvanizing. Just write for your copy.

UNIVERSAL MFG. CORP., ZELIENOPLE, 3, PA.

UNIVERSAL the only GALVANIZED SCAFFOLD

Government sees third-quarter upturn . . .

Plant Outlays Due to Climb

Business spending for plant and equipment, already at a high level, will be stepped up in the third quarter of this year, according to the latest survey conducted by the Securities & Exchange Commission and the U. S. Department of Commerce.

During the three months starting July 1, industry will invest in plant and equipment at an annual rate of $36.8 billion, up from the estimated $34.8-billion rate that businessmen planned for the second quarter, and well above the actual first quarter spending, which was at an annual rate of $32.8 billion.

Almost every industry group is set to share in the expansion boom. In some industries, the rate of capital spending will set new records, the government said.

Durable goods industries expect to make construction and equipment outlays at an annual rate of $8.55 billion in the third quarter. During the same period, non-durable goods industries expect to spend at an annual rate of $7.52 billion, public utilities at a rate of $5.28 billion, commercial and other industries (including trade, service, finance, communications and construction) $10.76 billion.

This last category expects to make outlays of $2,627 million during the July, August and September period, while public utilities will invest $1,431 million. Petroleum and coal products will account for $884 million; motor vehicles and equipment, $531 million; chemicals and allied products, $382 million and primary iron and steel, $357 million.

Commerce Secretary Weeks, in commenting on the optimistic capital expenditures report for the third quarter, made it clear that he welcomed the news because it will help offset some soft spots in the economy, such as the auto industry and homebuilding.

The survey showed that third-quarter plant and equipment spending programs would bring the rate of capital spending to a point almost 25% above the corresponding period in 1955.

Inflation in the higher spending total was discounted to some extent in the SEC-Commerce report. "While equipment prices and construction costs have risen steadily—about 7% and 4% respectively—since mid-1955, most of the dollar rise in investment over last year reflects a substantial increase in the physical volume of productive facilities," the report pointed out.

Despite Secretary Weeks' enthusiasm over the third-quarter forecast, the report showed that the SEC-Commerce Department March survey was too optimistic.

At that time, businessmen estimated their first quarter outlays for plant and equipment at an annual rate of $33.2 billion. The actual figure, however, turned out to be at an annual rate of $32.8 billion. And, the March report predicted that industry's second quarter capital expenditures would be at an annual rate of $35.3 billion. This second quarter spending is now scheduled at an annual rate of $34.8 billion.

The fact that the government's estimates were too high for both the first and second quarters raised the question of whether the present outlook for the third quarter was also too optimistic.

But Weeks sidestepped this point. He reiterated, at his press conference, earlier statements that he: (1) Thinks the new plant and equipment figures, the record mid-May employment total, and reports of record personal income in April are "the latest signs of the inherent health of the economy"; (2) that he still foresees a mild downturn in total business activity in the third quarter, mostly because inventories must be worked off in some industries; and (3) that a pickup in the fourth quarter makes it possible that 1956 would be a bigger year for total business activity than 1955.

He also said that the raising of the discount rate by the Federal Reserve Board in mid-April probably had not prevented businessmen from investing in new plant and equipment at the rate predicted earlier this year by the government.

But he did repeat his earlier criticism that the Fed's action was "ill-timed" and pointed out that in recent weeks, the Federal Reserve has been attempting to ease money market conditions somewhat by buying government securities on the open market.

Curiously enough, it was the ambitious plans of business to spend more for new plant and equipment that led, at least in part, to the Federal Reserve's fear that inflationary tendencies were beginning to develop in the economy.

The Fed was concerned about industry's capital expenditures plans principally because more and more companies were borrowing funds for this purpose, instead of financing expansion for retained earnings.

However, Weeks' statement would seem to indicate that the tight money market has not affected industrial building yet—and that one of the Fed's goals in raising the discount rate apparently has not been met.

State Groups Finance Bridge

Construction of a toll bridge across the Spokane River at Spokane, Wash., has been assured by negotiation for placement of the bonds to finance the project.

The Washington Toll Bridge Authority has agreed to sell the bonds to the Retirement Board of the State Employees' Retirement System and the State Finance Committee.

The retirement board will buy $4.5 million of Series A bonds at par. These bonds will carry a 4% coupon. The State Finance Committee will buy $1.5 million of Series B bonds, also at par, bearing interest at 2%.

For a few days, the fate of the toll bridge project was in doubt because of the tight money market. The Toll Bridge Authority rejected the sole bid received for the bonds when bids were opened June 5.

Lone bidder for the bonds was A. C. Allyn & Co., of Chicago, which offered $4.41 million for the $4.5 million issue, with interest at 4¼%. When this offer was turned down, Allyn made another offer to buy the bonds at par, with interest at 4%, provided the State Retirement Board agreed to buy the bonds from Allyn over a period of time. The authority also rejected this second offer and decided to deal directly with the State Retirement Board.

With financing assured, construction can be started quickly. Bids already have been received both for the superstructure and the substructure.

U. S. Steel Corp. is low bidder for the superstructure at $1,596,152 and Morrison-Knudsen is low on the subcontract at $674,552.

(B&F continued on page 136)

Commercial Building Setting a Record

Five-month total is 23% ahead of the same period in '55; buildup of proposed work gives the boom a firm foundation

Contract awards for commercial building picked up again in May after slipping in April. The upturn last month contributed to a five-month total that is running 23% ahead of the same period in 1955.

On the basis of the January-through-May contract figures and a continued high level of proposed work during the same period, commercial building seems certain to set a new record in 1956—well above last year's all-time high of $1,655.5 million.

Last month's $168 million in awards was up significantly over April's $119 million. The sharp gain helped to push the five-month total to more than $842 million, in awards for office buildings, shopping centers, department stores, and such private institutional buildings as schools, hospitals and libraries.

• **No letdown expected**—The supercharged five-month pace of contract awards for commercial building this year isn't likely to run out of gas in the next six or seven months, as was the case with this type of work last year.

Athough 1955 set a record for industrial building (up 17% over 1954), the high was actually posted only because of the first six months. Contracts finished the half-year mark 46% ahead of the previous year. For the balance of 1955, awards trailed 1954 by 6%. That's the background that makes the first five months of 1956 so important. With contracts topping the comparable 1955 period by 23%, commercial building this year is far outstripping the strongest part of a previous record year.

Equally important for the rest of this year's award pattern is the continued buildup of proposed work.

For eight months, the flow of new proposed commercial projects into the backlog has consistently and substantially topped the amount of work coming out of the backlog and into the contract stage.

Every such buildup in the past has resulted in a surge of contract awards later and there is no reason to believe that this accumulation of proposed work will be different.

Timing, of course, is important in commercial building. The amount of time that a project spends in the backlog of proposed work varies even on the type of construction. Commercial buildings often do not reach the contract stage as quickly as other types of work. However, even with this tendency toward longer planning periods, roughly two-thirds of the commercial buildings that move from the backlog into contracts, have been in the proposed stage for only one year —or less. And, about half of these reached the contract stage within six months from the time they were first proposed.

This underscores the importance of the sustained heavy flow of proposed work in the commercial building field.

• **Clouds on the horizon**—This sunny sky outlook for commercial building includes some small clouds, notably financing, materials and housing. Of the three, financing appears to be the most immediate problem and the one that could have the greatest effect.

While any type of construction is hurt by a tight money market, commercial building could be particularly vulnerable at this time because of the importance of shopping centers in the current boom.

A large number of these shopping centers are multi-million projects, ranging from the $2-million to $5-million class up to $20 million or more. Because of their size, these projects often require firm financial commitments months before they even approach the contract stage. If the developers have difficulty lining up the financing they need, the projects are either scaled down or are held in the planning stage for a longer time than normal.

To a lesser extent, the same problem may arise with office buildings, which also are important in today's high level of commercial activity.

• **Enough materials?**—Although financing is the biggest single threat to the commercial building boom, materials shortages also could put a damper on this type of construction, particularly in the late summer and early fall when roadbuilding takes a big bite out of the materials supply.

The third question mark is housing, currently well behind last year's record level. Shopping center construction is affected to some extent by the volume of housing, although it does not react immediately to either an upturn or a decline in housing awards.

If housing falls consistently for the balance of the year, commercial building activity will drop, too. But this is held unlikely. And, if housing can stage a comeback by August, there is a good chance that commercial building might not dip at all, because the pressure of proposed work at this time could keep the boom rolling easily for several months without any further assist from homebuilding.

Underground Plant

Engineering-construction firm joins manufacturer in buying Alabama site

The engineering-construction firm of Mason & Hanger-Silas Mason Co., Inc., last week joined with American Machine & Foundry Co. in the purchase of a 2,660-acre site near Huntsville, Ala., for an underground manufacturing plant. The experimental project will be built under a mountain.

AMF has been interested in foreign experience with underground construction, particularly in Sweden, and the company reportedly spent nearly four years criss-crossing the United States searching for an ideal site.

Mason & Hanger apparently were drawn into the partnership because of their previous experience in tunnel and other underground construction. Both companies feel that space for industrial use can be provided at less cost underground than for a comparable surface plant with the added advantage that certain maintenance costs would be lower.

No heating or air conditioning would be required for the plant, according to the companies, because temperature within the plant would remain nearly constant at 63 F.

The mountain purchased by the two firms is a solid limestone formation that rises to an elevation of about 1,400 ft. The limestone excavated from the mountain will be sold.

For AMF, this is regarded as a completely experimental project. This will be one of the few AMF plants owned outright by the company. In most cases, AMF builds a plant, sells it to an insurance company or other investor and then takes a long-term lease.

Cost estimates are not available for the plant yet because the size has not been determined. The site itself, however, cost $315,000.

(*B&F continued on page 139*)

▲ New P. H. Glatfelter Company Paper mill at Spring Grove, Pa. averages 615' x 100' x 65' overall. Erector: Belmont Iron Works, Phila., Pa.; Engineers: J. E. Sirrine Company, Greenville, S. C.; General Contractor: R. S. Noonan, Inc., York, Pa.

Two-man crews assemble steel expertly and fast using impact and holding wrench. ▶

BOLTS make joints **STRONGER**

RB&W high strength bolts fortify paper mill against vibration ...save time in construction, too

THIS STRUCTURE is built to last. While there will be plenty of vibration and dynamic stress when 430-ft. paper making machine starts rolling . . . when a 30-ton crane spanning 50 feet starts working... the joints will stay tight.

Belmont Iron Works of Philadelphia assured this by erecting the 2000 tons of steelwork with RB&W high strength bolts.

High strength bolts are stronger and safer to install than rivets. Torqued almost to yield strength, they permanently clamp members without loosening. With higher residual tension, they give much greater resistance to fatigue from changing loads. Recent tests prove they develop *optimum* shear strength in a joint.

Bolting is also a time-saving, cost-cutting operation. Two-man crews do the installing . . . and can be quickly trained on the job, even in out-of-way locations. Ironworkers like the uniformity of threads and ease of handling of RB&W bolts. They know they can depend on RB&W quality on all jobs . . . buildings, bridges, equipment.

New RB&W Bulletin HS-1 gives all the information a man needs to work expertly with high strength bolts. How many copies would you like?

Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York . . . *largest independent producer of high strength bolts for construction.*

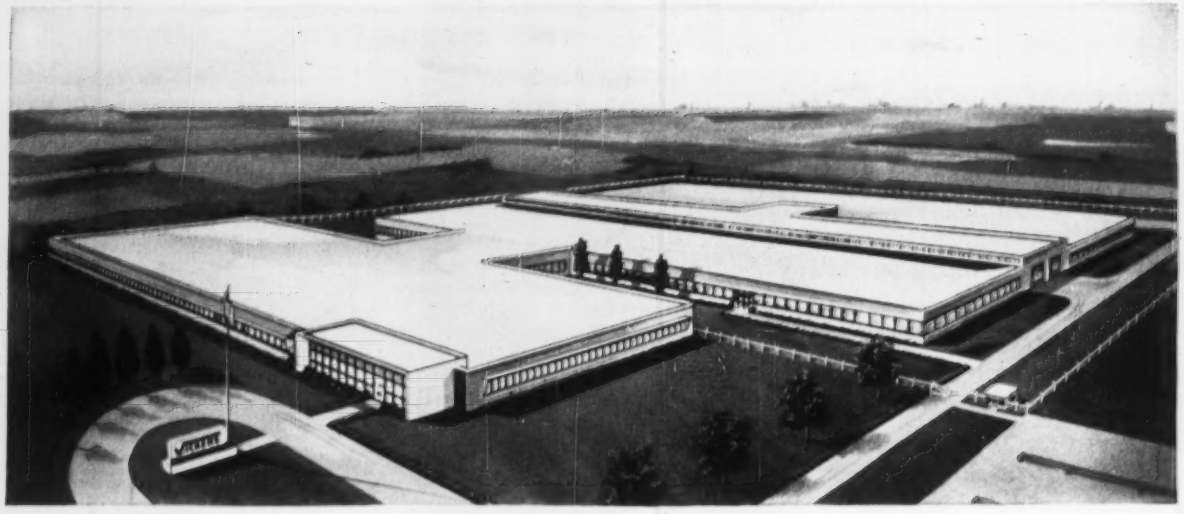
R B & W

110th year

Plants at: Port Chester N. Y.; Coraopolis, Pa.; Rock Falls, Ill., Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee, New Orleans, Denver, Seattle. **Distributors** from coast to coast.

VICKERS

NEW ADMINISTRATIVE and ENGINEERING CENTER



Dedicated to the **Development** and **Improvement** of **Hydraulic Components and Systems**

Vickers, a pioneer in oil hydraulics for a wide variety of uses, has maintained leadership through the years by means of aggressive and extensive research.

Continuing rapid expansion of the oil hydraulics requirements of industry has brought with it the need for augmented research and engineering facilities. To meet this need, Vickers has just completed this new building in suburban Detroit . . . 150,000 square feet devoted entirely to research, development, engineering application and administration.

A milestone in Vickers progress, this new Administrative and Engineering Center is also a promise of future benefits to users of Vickers hydraulic components and systems.

VICKERS INCORPORATED
DIVISION OF SPERRY RAND CORPORATION
ADMINISTRATIVE and ENGINEERING CENTER
Department 1496 • Detroit 32, Michigan

Application Engineering Offices: **• ATLANTA • CHICAGO • CINCINNATI • CLEVELAND DETROIT • HOUSTON • LOS ANGELES AREA (El Segundo) • MINNEAPOLIS • NEW YORK AREA (Summit, N.J.) • PHILADELPHIA AREA (Media) • PITTSBURGH AREA (Mt. Lebanon) • PORTLAND, ORE. • ROCHESTER • ROCKFORD • SAN FRANCISCO AREA (Berkeley) • SEATTLE • ST. LOUIS TULSA • WASHINGTON • WORCESTER**
IN CANADA: Vickers-Sperry of Canada, Ltd., Toronto

7385

Engineers and Builders of Oil Hydraulic Equipment Since 1921

Cement Supply

Some cities short now, others getting tighter

Despite increased capacity of the mills and the delaying action on construction of a cold, wet spring, ENR's reporters are pointing up some possible trouble spots ahead for cement.

Baltimore's highway program already is handicapped by slow deliveries from ready-mix concrete plants that are short of cement. Many Maryland cement mills are sold out for the entire year. Imported cement is being sought. The shortage is expected to grow worse this summer.

Detroit ready-mix concrete plants now expect to cope with tight cement supplies later this summer, although the supply has been easy so far because of poor construction weather and a strike.

Another trouble spot is Minneapolis, where demand is now pushing ahead of supplies.

Denver, Kansas City and New Orleans report cement shortages. And, in Philadelphia, only regular customers are getting the cement they need.

Bids Soon to Be Called for Unique 70-mi Slurry Pipeline

American Gilsonite Co. will call for bids within 30 days for construction of a 70-mi pipeline that will feature one of the longest pipeline suspensions in the United States—an 1,800-ft jump across the White River in eastern Utah.

The 6-in. ID line will carry Gilsonite in a water slurry from the Bonanza Mine to a new coke refinery near Fruita, Colo.

Included in the project will be a reservoir atop 8,500-ft Baxter Pass in Colorado. This reservoir will permit an emergency flow of water either east or west from the pass in the event of flow interruptions on the Bonanza or Fruita side.

California Voters Approve $40-Million School Bonds

Oakland, Calif., voters approved a $40-million school bond proposal by a healthy margin in the June 5 election. It was the third try for the Board of Education which met defeat at the polls twice in 1954 with smaller school bond proposals.

Proceeds from sale of the bonds will finance construction of 13 new schools and additions to—or reconstruction of—32 existing schools. Some of the money also will be used for acquisition of additional school sites.

First phase of the construction program consists of three new schools and additions to eight existing schools. This work, totaling $10 million, will start next year. Preliminary plans already are completed.

The Board of Education expects to retain architects soon for the schools that will be included in the second phase of the program.

Municipal Authorities Face State Probe of Operations

Financial operations of 977 municipal authorities in Pennsylvania will be scrutinized by the state's Justice Department.

Acting under a previously-unused section of a 1945 act, Attorney General Herbert B. Cohen has established a new Division of Municipality Authorities Examination to screen the records of the local authorities.

They have been asked to provide the state with copies of their trust indentures, covering their financing, as well as books, records and accounts detailing their operations in the past three years.

The 977 local authorities are in the following fields: school building, 474; water, 150; sewerage, 106; general, 148; airport, 15; housing, 24; parking, 43; and sewerage and water combined, 17.

Business Briefs . . .

• **Bond sale threatened**—A $225-million bond program to finance four-lane superhighways in Michigan has run into legal obstacles stemming from a 1955 act that boosted the state gasoline tax. Gov. Williams may call a special session of the legislature to straighten out the matter. Meanwhile, issuance of $70 million in bonds, originally scheduled for early July, probably will be postponed.

• **Bay area boom**—San Francisco's Bay area and northern California recorded the second largest industrial development boom in the postwar era during the first three months of this year, with $78.7 million going into industrial building in the 12-county bay area and $100.3 million for northern California.

• **More steel capacity**—U. S. Steel will boost its annual ingot tonnage at the Fairless Works by adding a new blast furnace identical with the two already producing pig iron at the Morrisville, Pa., plant. Contract for construction of the new furnace went to Arthur G. McKee & Co. Completion is scheduled in one year.

• **Atom insurance**—Lloyds of London has announced that it is ready to offer insurance on an atomic power station. Details of premiums and insurance coverage aren't available yet, according to the British underwriting group.

• **No financing problem**—At least one commercial building project on the West Coast should not be affected by the tight money market. Gibraltar Savings & Loan Assn. expects to build—sometime around the end of this year—a new $2 million headquarters building in Beverly Hills, Calif.

• **Lease-purchase project**—Plans for a $30.8-million customs house and Federal office building in Los Angeles have been approved by General Services Administration under the lease-purchase program. If the House and Senate Public Works Committees give their blessings, the project will be built on a site adjacent to the Los Angeles Civic Center.

• **Construction breeds construction**—As a result of a $60-million expansion at its Lackawanna, N. Y., plant, Bethlehem Steel discovered it needed more office space, will break ground early in 1957 for a six-story, $2-million office building.

• **Private utility**—The chief construction engineer for the City of Phoenix, Ariz., is heading a private sewage disposal company that is being incorporated to serve the resort town of Scottsdale, Ariz., and the surrounding area. Original construction program of the company adds up to $250,000, including a disposal plant.

• **Seek court test**—The Florida Securities Commission has asked the state attorney general for a court test of the validity of a 1955 state enabling act that permits the creation of development credit corporations to provide risk capital when it is not otherwise available for industrial expansion.

• **Invest school funds**—A state legislative council committee in Kansas has been authorized to draft a bill under which up to $6 million of the state's permanent school fund could be invested in first mortgages to build and expand industrial plants. The money could also be invested in bonds issued by small town industrial districts.

AFL-CIO pushes settlement of . . .

Industrial Union Dispute

This week, the AFL-CIO is taking another stab at diminishing the conflict between craft and industrial unions—a conflict that has already stalled some of the federation's goals and threatens further trouble for the future.

One of the results of last week's meeting of the top-level AFL-CIO Executive Council was the scheduling of a conference between federation President George Meany and 19 presidents of building trades unions. At this session, due the end of the week, Meany is expected to flatly advise the craft unions to call off their opposition to union mergers in the states, or jeopardize their chances for a hearing before the Executive Council.

The coming meeting, and stand Meany will take, stem from the council's newest action on the running dispute. It is a follow-up of a series of events caused by the jurisdictional fight between craft and industrial unions over construction work in industrial plants.

Last month, to point up the failure to resolve the job-rights conflict, 18 building trades presidents notified their state organizations to oppose merger of CIO and AFL state bodies until an agreement is worked out. An appeal from the Executive Council at that time to withdraw opposition to state mergers has gone unheeded.

The issue again came before the council members last week, but there was no face-to-face meeting with the president of the Building Trades Dept., Richard J. Gray. Gray, who awaited a call to discuss the issue before the council members, was approached, instead, by a delegation from Meany to set up the meeting for this week.

Meany's strategy is to insist on a follow-through of the council's order to retract opposition to state mergers before any further steps are taken on the jurisdictional problem. It came shortly after appearance of the first concrete results of the craft unions anti-merger campaign. The proposed alliance of AFL and CIO units in Mississippi was blocked by the building trades' opposition.

Even if the craft union presidents renounce their opposition, it's unlikely that any settlement plans will evolve from the AFL-CIO high command. The jurisdiction issue shows no signs of abating, and promises to be one of the major conflicts within the federation for some time to come.

Several days before last week's council session, Gray's department drew up details of the current conflicts in an effort to illustrate to Meany the urgency and scope of the problem.

A complete report of 18 recent disputes, mostly between the craft unions and the two big industrial unions—the auto workers and steelworkers—was given to Meany and sent to all state and local bodies aligned with the building trades.

These 18 disputes involve such problems as installation of machinery, maintenance and new construction work which the craft unions insist are within their jurisdiction. A strong protest is registered against negotiation of industrial union contracts that provide for performance of such work by their members.

While the Executive Council put off any definite action on the jurisdictional problem, it tackled a number of other problems:

Organization—The council ordered an organizing campaign to get under way immediately in the textile industry despite failure by rival textile unions to lay the groundwork. With an estimated 700,000 non-union textile workers, mostly in the South, the council advised its organizing department to move ahead and let the textile unions work out their differences later. This was an about-face from the original plan to hold up membership drives in those industries until conflicting unions could settle on the plants to be organized by each union.

Teamsters-ILA—The council had planned a new policy directive that would ban pacts between AFL-CIO affiliates and previously expelled unions at this session. But this was pulled back when the union leaders decided that it wasn't necessary when teamster President Dave Beck once again advised the council members that its working alliance with the expelled longshoremen's union was dead. No further action was taken on the question at this time.

Ethical practices—New and stronger authority to crack down on corrupt elements within the AFL-CIO was granted to the federation's ethical practices committee. That committee, headed by machinists' President Al J. Hayes, was given the power to take up its own investigations, formerly reserved by the council, and hearings are planned by the committee within the next few weeks. The first targets will be those unions named by Congress as being involved in corrupt practices with union welfare funds.

Politics—The council postponed a scheduled decision on whether to hold a special convention this fall to endorse a Presidential candidate. The decision, which is to be made at the next council session in August, was held up in the face of some "pessimistic" reports by AFL-CIO political leaders on the general political picture.

Wage Talks Hold Firm as Rates Go Up

Contract negotiations in the construction industry have remained generally firm and tense, with the results being as heterogeneous as the industry itself.

A wage increase amounting to 25 cents an hour is still a favorite demand in many areas, 15 cents a common settlement figure, and two-year contracts an acceptable formula. Traditional fringe benefits seem to be holding their own, as newer ones—like savings plans and profit-sharing—gain some attention. Contractor resistance, geared to the fear of a competitive squeeze, is no longer news and even some of the older strikes drag on, as weekly payroll losses mount, scheduling goes awry, and costly interest accrues on financing obligations.

• **Settlements**—Wage-wise, one of the bigger settlements has been won by bricklayers in Greater New York—25 cents an hour this year and 20 cents next, pushing present rates to $4.05 (jumping to $4.25 cents next May) while retention of welfare and pension fund contributions add another 4% and 20 cents, respectively. Coming out on the shorter end were laborers in Paducah, Ky., who ended a two-week strike with two 5-cent raises under a two-year contract, which establishes the new rate for skilled laborers at $2.35.

Typical of the range between the two are a 15-cent boost for Ohio operating engineers under a state-wide (except Cleveland) one-year contract with

(Continued on page 142)

CLINTON WELDED WIRE FABRIC... IN FAMOUS STRUCTURES EVERYWHERE

506 OLIVE STREET, ST. LOUIS*

EARLY 1900'S

built well to begin with... still in great shape

100,000 square feet of Clinton Welded Wire Fabric... that's what went into the floors of this downtown St. Louis landmark when it was built half a century ago.

Today, the building is still in excellent condition... proof that Clinton Welded Wire Fabric contributes long-lasting properties to reinforced concrete structures.

And you could find innumerable other examples of outstanding durability... apartment houses, baseball parks, hotels, office buildings, schools and college buildings, hospitals, etc.... all reinforced with Clinton Welded Wire Fabric.

Clinton Welded Wire Fabric is made from wire drawn in our own plants, from our own steel, under CF&I's highest standards of quality control. Because this quality is built into Clinton Welded Wire Fabric, it can be relied upon to provide maximum strength, with minimum cracking, in all concrete reinforcement jobs.

Try Clinton Welded Wire Fabric on your next project. Our sales representatives are always ready to discuss your requirements. Call or write today.

*First known as the Third National Bank Building, now referred to as the Mississippi Valley Building.

3581

WHEN THEY ASK...
"is it Reinforced"
SAY YES... WITH

CLINTON
WELDED WIRE FABRIC

CF&I

WICKWIRE SPENCER STEEL DIVISION: Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
THE COLORADO FUEL AND IRON CORPORATION: Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth
Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City
San Francisco • Seattle • Spokane • Wichita • CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Toronto • Vancouver • Winnipeg

141

the Ohio Contractors Association; an average wage increase of 15 cents for operating engineers in 11 southern California counties; pay hikes averaging 15 cents for six crafts in Elmira, N. Y., with contracts hitting both the one and two-year marks; and a 15-cent across-the-board increase each year in a two-year contract for Detroit reinforced steel workers, who ended their strike against the AGC after winning a clause requiring the hiring of a rodman while concrete is being poured or reinforced.

• **Strikes**—Meanwhile, a construction strike in the Sabine area of Texas (ENR May 10, p. 121) moved into its 10th week as some looked to the pipefitters to break the deadlock. A host of projects in New Orleans, including the Mississippi River Bridge, have been stalled by strikes of iron workers, rodmen and carpenters, who won't go along with earlier settlements of a 20-cent package in two-year contracts.

In Buffalo, N. Y. progress on scores of commercial and industrial projects has been stymied by strikes of painters, roofers and bricklayers. Although the bricklayers later returned to work without a contract, roofers are reportedly seeking a 25-cent boost (which they had once lowered to 17½ cents), and painters are asking for 12½ cents now, 7½ in September and 12½ next June. And construction in Ohio's Akron area has been hit by a strike of building material supply drivers who are pushing for a 25-cent raise.

• **Fringe benefits**—Another strike involving fringe benefits is perhaps in the making in northern California, following employer rejection of a proposed contract for plumbers Local 38, which tried to negotiate a savings plan that would afford, among other things, supplementary relief to the unemployed (ENR May 31, p. 88).

A similar proposal by a neighboring unit—plumbers Local 159 in Richmond, Calif.—is also expected to encounter employer resistance, although one contractor group has already indicated general approval of the plan. Under the proposed four-year contract, contractors would contribute 25 cents an hour per man to a savings fund and 5 cents an hour to a special fund, both to be administered by a Joint Industry Board. The savings fund would be represented by individual employee savings accounts for use during unemployment and disability, and the special fund would be used for "betterment of the industry."

In a more novel approach to fringe benefits, the Honolulu Construction and Draying Company has put 340 members of an independent union into a profit-sharing plan that will divide 10% of profits before taxes among all employees. The plan was adopted in lieu of a pay raise during a wage reopening and becomes effective for the year beginning August 1.

A GAW Problem

Right to dual payments still a stumbling block

A court action in Connecticut and the opening of collective bargaining negotiations in the steel industry again focused attention last week on guaranteed annual wage plans for organized labor.

The Manufacturers Association of Connecticut—one of the first employer groups in the nation to seek a court ruling on the right of a state to make unemployment compensation payments to a worker simultaneously receiving GAW payments—has asked the Superior Court to upset the state attorney general's ruling that dual payments are valid.

Hearings on the Connecticut issue opened last Friday, a day after the United Steel Workers met in New York with executives of the nation's "big three" steel producers to commence negotiations for a new contract in which the union hopes to see an extension of the GAW plans successfully launched last year in the auto industry. At the same time, the building trades were becoming deeper involved in the legal questions posed, as some of the California plumbers sought to provide for dual unemployment benefits through negotiated savings plans (see page 140).

The Connecticut Manufacturers take the position that GAW payments are wages within the meaning of the state jobless benefit law, thus barring simultaneous receipt of state benefits. It also argues that private plans benefit a small group of employees at the expense of others, since employer contributions would otherwise be available to all employees in the form of wages, pensions, vacation pay or other fringe benefits.

Meanwhile, the federal Internal Revenue Service has complicated the legal issue by ruling that GAW payments are not wages for the purposes of withholding and social security taxes, but are taxable income to the recipients as non-wage income.

So far, 20 jurisdictions, either by administrative rulings that can still be questioned, or by legislative action, have approved dual payments: Arkansas, California, Connecticut, Delaware, District of Columbia, Florida, Georgia, Illinois, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New York, Pennsylvania, Washington and Wisconsin.

At the present time three states have ruled against them: Indiana, Ohio, and Virginia.

The Illinois ruling—one of the latest—points up the broad issue involved, when compared with the claims of the Connecticut group. Said the attorney general: The state law does not "forbid an employer from gratuitously extending additional aid to personnel in periods of unemployment. That the employer seeks to do so by contract rather than gratuity does not call for a different interpretation. The legislative object and purpose is furthered in either case, i.e., assistance to the unemployed and relief of the taxpayer of such burden."

Right-to-Work Laws

Supreme Court decision narrows basic issues

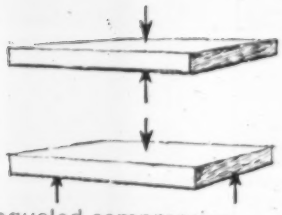
The U. S. Supreme Court added another chapter last month to the growing controversy over right-to-work laws, when it ruled that the right-to-work clause in the Nebraska constitution is inapplicable to railroad union shop agreements.

In a unanimous decision, the court left intact the laws now adopted in 18 states, but held that the supremacy clause of the federal Constitution prevents a state from prohibiting union-shop agreements in areas where Congress has specifically authorized them.

The action was started by five Union Pacific Railroad employees, who argued that a union shop agreement, although authorized by the federal Railway Labor Act, was invalid in Nebraska because it is outlawed by the state's constitution. Because of that provision, the State Supreme Court had ruled the Railway Labor Act inapplicable in Nebraska.

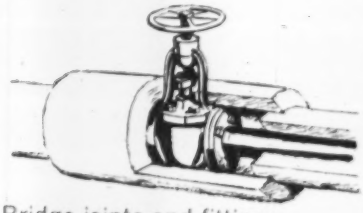
Of particular significance, was the U. S. Supreme Court's ruling that union membership may be imposed as a condition of employment without violating either the First or Fifth Amendments, which guarantee freedom of speech, freedom of assembly and the right to life, liberty and property unless taken by due process of law.

(*Continued on page 145*)



Unequaled compressive and flexural strength!

Saw it . . . nail it . . . shave it . . . drill it!



Bridge joints and fittings without fear of breakage!

KAYLO® and FIBERGLAS*

INDUSTRIAL INSULATIONS

. . . distributed by approved Fiberglas distributor-contractors . . . offer the most versatile family of plant insulations available. With new *pink* Kaylo-*20* (increasing the upper range of Kaylo by 600° F.!), you can now order—from *one* reliable supplier—complete insulation coverage *from lowest sub-zero to 1800° F.*, serving such extra-high temperature applications as catalytic cracking units, refractory wall backing for furnaces and boilers, and fireproofing of piping, equipment, and vessel skirts. See *Sweet's Files, Chemical Engineering Catalog*, or *Refinery Catalog*. Or write Owens-Corning Fiberglas Corporation, Dpt. 145F-14, Toledo 1, Ohio

OWENS-CORNING
FIBERGLAS

*T-M. (Reg. U.S. Pat. Off.) Owens-Corning Fiberglas Corporation
® T-M. Reg. Owens-Illinois Glass Co., Inc., mfr. of Kaylo

Specify

KAYLO®

Heat Insulation

for strength and lightness!

1. Safeguards steel shapes against corrosion during shipment and erection

2. Makes an excellent foundation coat for field painting

ONE OF THE South's most recent road-building improvements is the new $15-million Eugene Talmadge Bridge across the Savannah River at Savannah, Georgia.

The 710-foot main span of this structure consists of two cantilevered trusses supporting a central truss section. Anchor spans for the main crossing cantilevers are made up of 275-foot trusses. Fifty girders, ranging from 50 to 140 feet in length, make up the approaches to the main span. The American Bridge Division, United States Steel Company, is the contractor for the steel work.

By painting girders and trusses with Pittsburgh's X-L-O Structural Steel Primer, these shapes were safeguarded against corrosion during shipment and erection. This remarkable finish is derived from linseed oil combined with red lead and oxide pigments. Its unexcelled wetting properties insure uniform protection even on surface irregularities caused by mill scale. Speedy drying permits fabricated parts to be shipped to the job site within 24 hours after priming.

X-L-O reduces risk of surface failures that necessitate premature cleaning and painting. It serves, too, as an excellent foundation for final coats. Pittsburgh's IRONHIDE and METALHIDE in a suitable range of colors are available for field painting.

Why not call on us for advice or suggestions to protect structural steel in transit or on the job? We may be able to save you time and money. Write, wire or call the Pittsburgh Plate Glass Company plant nearest you.

PITTSBURGH PLATE GLASS CO.
Industrial Paint Division, Pittsburgh, Pa.

Factories: Milwaukee, Wis.; Newark, N.J.; Springdale, Pa.; Atlanta, Ga.; Houston, Texas; Torrance, Calif.; Portland, Ore. Ditzler Color Division, Detroit, Michigan, Thresher Paint & Varnish Division, Dayton, Ohio; Forbes Finishes Division, Cleveland, O. M. B. Suydam Division, Pittsburgh, Pa.

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

(Continued from page 142)

If Section 14(b) of the Taft-Hartley Act, which authorizes states to outlaw contracts requiring union membership, should be repealed, as urged by the AFL-CIO building trades, right-to-work-law proponents would now have little chance of knocking down union shop agreements on constitutional grounds. Admitting that the prohibition of union shops within the limits authorized is a lawful exercise of a state's police power, the court nevertheless declared that use of the "union shop as a stabilizing force seems to us to be an allowable one."

When the Nebraska case went up to the Supreme Court, both Texas and Louisiana filed "friend of the court" briefs, asking that the state laws be upheld. One of the legal arguments—now considerably weakened—was that union shop agreements are in themselves unconstitutional.

Construction Work Resumes At Hanford Atomic Project

Construction workers at the Hanford Plutonium Works near Richland, Wash., were ordered back to their jobs June 5th, after a 76-day work stoppage resulting from a dispute over transportation pay to jobs inside the atomic plant reservation.

Representatives of the Associated General Contractors and the striking unions, meeting in Spokane, agreed to submit the issue to the Atomic Energy Commission's Labor-Management Relations Panel. Pending settlement, contractors have consented to restore the pre-strike conditions.

Teamsters, operating engineers and cement finishers called the strike when the workers were taken out from under the project agreement and put under existing AGC area contracts, which didn't allow in-reservation travel pay (ENR May 24, p. 109).

Meanwhile, a million-dollar damage suit, filed by Morrison-Knudsen Co. against the teamsters and operating engineers is still pending.

Prevailing Wage Question Arises on Ohio Road Work

In a suit filed by the Associated General Contractors in Akron, Ohio, a local of the laborers union has been temporarily enjoined from supplying workers in two Ohio counties for public works—particularly highway work—at less than Akron wage rate.

The action is of particular interest in view of the present likelihood that the prevailing wage provisions of the Davis-Bacon Act will be included in the multi-billion-dollar federal highway program, now that a Senate-House conference committee has before it Davis-Bacon amendments from both sides of Congress.

The Ohio action is reported to have stemmed from an attack by outside contractors on the going rate for labor in the two counties for which the Akron rate had been certified as the prevailing rate for public works.

According to the AGC attorney, two contractors doing road work in Medina and Portage Counties have obtained laborers at 35 cents an hour under what Akron contractors are required to pay.

Labor Briefs . . .

• **Vacation shutdown**—Marble workers will set a precedent for metropolitan New York building trades when they shut down for a one-week vacation July 1 as provided in a contract, negotiated last year, that set up a vacation fund to which employers contribute 10 cents and hour per man.

• **Training aide**—Dan MacDonald of San Jose, Calif., has been named the sixth national apprenticeship coordinator for the plumbing and pipefitting trades—the only ones that can boast so many. Senior business agent of plumbers Local 393, MacDonald was president of Northern California Council of Plumbers.

• **Helping hand**—Schacht Steel Construction Co. of New York and New Jersey has donated funds to set up courses in structural steel detailing at New York's Mechanics Institute to help overcome a shortage of trained drafting personnel in the structural steel industry.

• **Shorter workweek?**—The AFL-CIO's Department of Research will hold an inter-union conference in September to discuss the shorter workweek's pros and cons. Meanwhile, some California carpenters are looking for a 7-hour day, and Reuther has listed a shorter workweek as the auto workers' next major collective bargaining goal.

• **Political contributions**—Wisconsin's attorney general says the purpose of the state's controversial Catlin Act—to prevent money of union members from being used to support candidates not of the donor's choice—is "clearly constitutional." Milwaukee's D. A. had earlier ruled the act arbitrary, discriminating and in violation of freedom of speech and press.

OFFICIAL PROPOSALS

Bids: June 26, 1956

The Hydro-Electric Power Commission of Ontario

ST. LAWRENCE POWER PROJECT
SIXTEEN UNIT COVERS

SEALED TENDERS, in quadruplicate, addressed to the undersigned, 620 University Avenue, Toronto 2, Ontario, and clearly marked
"TENDER FOR ST. LAWRENCE POWER PROJECT SIXTEEN UNIT COVERS
will be received up to 4:30 o'clock p.m., Eastern Daylight Saving Time, on
TUESDAY, JUNE 26, 1956

The work to be done will comprise the design, manufacture, fabrication, testing, supply, delivery, and guarantee of sixteen (16) weather-proof generator unit covers complete with travel drive, travel locks, seals, travel stops, controls, embedded curb steel and anchors; total estimated weight 490 tons.

Delivery is required as follows: Curb frames and anchors February 1, 1957, to June 1, 1959; covers April 1, 1957, to February 1, 1959.

Copies of the tendering documents may be obtained on or after May 31, 1956, at the office of the Director of Supply, 620 University Avenue, Toronto 2, Ontario, on payment of ten ($10.00) dollars for each set. This charge will not be refunded.

Tendering documents may be inspected at the above address and at the offices of the following: the Commission's Field Office, Cornwall, Ontario; Power Authority of the State of New York, 270 Broadway, New York 7, New York; and Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts.

The lowest or any tender will not necessarily be accepted.

E. H. Easson
Secretary

Bids: June 27, 1956

Construction of Water Plant

NOTICE TO CONTRACTORS

Sealed proposals, addressed to the Anne Arundel County Sanitary Commission, Glen Burnie, Maryland, for the construction of the Dorsey Road Water Plant will be received at its office until 3:00 P.M., E.D.S.T. June 27, 1956, at which time they will be publicly opened and read.

All proposals must be made upon the forms provided and must be plainly marked on the outside of the sealed envelope "Proposal for Dorsey Road Water Plant, Contract No. 15-BW."

Plans, specifications and other contract documents may be obtained at the office of the Commission, Glen Burnie, Md. upon payment of $25.00, which amount will not be returned.

The Commission reserves the right to reject any or all bids and to waive technical informalities, as its interests may require.

Each proposal must be accompanied by a certified check or bid bond acceptable to the Commission in the amount of not less than five per cent (5%) of the total bid amount.

The successful bidder will be required to be bonded to the amount of his proposal for faithful performance of the Contract.

ANNE ARUNDEL COUNTY
SANITARY COMMISSION
W. Calvin Gray, Chairman
Edwin A. DeVault,
Secretary-Treasurer

U. S. Government

GOVT. OF DIST. OF COL., DEPT. OF HIGHWAYS, June 4, 1956. SEALED PROPOSALS will be recd. in Rm. 404, 499 Pa. Ave., N.W., Wash. 1, D.C., until 2 P.M. EDT, June 29, 1956, and then publicly opened and read for constr. 4 Pedestrian Overpasses over Kenilworth Ave. from vic. of Hayes St. to Polk St. (Fed. Aid Proj. F-45(7)), consist. of 2,800 cu. yds. excavation; 1,180 cu. yds. Class BII concrete; 190 cu. yds. prestressed concrete; 84,900 lbs. reinf. steel; 54,200 lbs. structural steel; 6,600 lbs. high tensile wire; 3,470 lin. ft. aluminum railing; 780 lin. ft. steel H-piles; 8,600 sq. ft. stone facing; 21,200 cu. ft. masonry backing; and heating equip. for melting snow on ramps. Proposal forms, plans and specns. obtainable from Supervisor, Contr. & Bond Section, Procurement Office, D.C., Rm. 406, 499 Penn. Ave., N.W., upon deposit of a certified check for $20.00 per set, payable to Collector of Taxes, D.C. (Tel. NA 8-6000, Ext. 2378).

OFFICIAL PROPOSALS

Bids: June 28, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Article 2, Title 2 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 28th day of June 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 353 Broadway, Albany, N. Y.						
Rensselaer (Route 153)	FASS 56-5	West San Lake-Poestenkill-Cropseyville, Pt. 2 Proj. No. S486(1)	2.16	Bit. Mac. Pen. Meth., Ty. 1=2.04 Mi.; Asp. Conc. Opt.=0.02 Mi.; Misc. Work=0.10 Mi.	$15,000 Plans $10	$267,000
Saratoga (Route 197)	FARC 56-42	Reynolds Corners-Fort Edward, S.H. 1748 Proj. No. S401(1)	0.76	Asp. Conc. Opt.	$9,000 Plans $10	167,000
DISTRICT No. 3, Wm. Robinson, District Engineer, 301 E. Water St., Syracuse, N. Y.						
Onondaga (Route 57)	FAC 56-1	City of Syracuse: Oswego Boulevard Proj. No. IN463(10)	1.44	Demolition	$2,800 Plans $10	50,000
Onondaga (Route 298)	FARC 56-47 FASH 56-3	Syracuse-Bridgeport, Pt. 1, S.H. 672; Syracuse-Bridgeport, S.H. 672A; Syracuse-Bridgeport, Pt. 3 (Seq. No. 298-1-5). Proj. No. U-UG994(5)	2.70 (2.11 Acc.)	9" Cem. Conc. Pavt.; 2 at 37' Var. Wide=3.59 Mi.; Asp. Conc. Ty. 2A=1.22 Mi.; R.C. Box Culv. Br. 25'; R.R. Sep. I-Beam 103.7'	$130,000 Plans $25	2,350,000
Onondaga and Oswego (Route 11)	FARC 56-40 RC 56-41	Cicero-Brewerton, S.H. 5249; Central Square-Union Square, S.H. 5415; Union Square-Pulaski, Pt. 1 and Pt. 2, S.H. 5063-5221; Pulaski-Sandy Creek, S.H. 5275 Proj. No. F463(11)	26.05	Asp. Conc. Ty. 1A	$45,000 Plans $10	800,000
Seneca (Routes 5 and 20)	FARC 56-38 RC 56-39	Geneva-Waterloo, S.H. 5087; Geneva-Waterloo, Pts. 2 and 3, S.H. 8240. Proj. No. F406(4)	1.58	Asp. Conc. Ty. 1A	$6,000 Plans $10	111,000
Tompkins (Route 34)	FARC 56-46	Esty Glen-South Lansing, S.H. 5256 Proj. No. F447(5)	3.08	Asp. Conc. Ty. 1A	$6,000 Plans $10	113,000
Tompkins (Route 13)	FARC 56-37	Groton Village; Freeville Village; Dryden Village, S.H. 1092. Proj. No. F513(5)	1.33	Asp. Conc. Ty. 1A	$4,300 Plans $10	77,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, 65 Court Street, Buffalo, N. Y.						
Erie (Routes 18 and 62)	FARC 56-45	Niagara Falls-Buffalo, Pt. 5 and Pt. 4, S.H. 5193-5172 Proj. No. F500(6)	4.56	Asp. Conc., Opt.	$24,000 Plans $10	436,000
DISTRICT No. 8, Kurt G. Rauer, Acting District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Orange (Route 17K)	R.C. 56-43	Montgomery Village: Ward Bridge, and Union Sts. S.H. 1675		Demolition	$150 Plans $10	2,500
Westchester Thruway)	FANETC 56-4 FASTC 56-7	New York State Thruway, New England Section, Sub. NE 4 (North St. to Boston Post Road) and 5 Access or Cross Roads. Proj. No. IN-1068(12)	1.43 (0.08 Acc.)	9" Cem. Conc. Pavt. 2 @ 37' Var. Wide=1.29 Mi.; Asp. Conc., Opt.=0.14 Mi.; Asp. Conc., Opt. (Access Roads)=0.08 Mi.; 3 Hy. Sups. Comp. I-Beams 111.8' 54.5', and 409.1'; 1 Conc. Arch Br. 25.5'	$150,000 Plans $100	2,650,000
DISTRICT No. 10, M. E. Goul, District Engineer, 325 West Main Street, Babylon, L. I., N. Y.						
Queens (Route 25D)	FA HHE 56-1	Horace Harding Expressway, Section 1, Contract 4 Proj. No. U-802(8)	1.09 (2.56 Acc.)	9" Cem. Conc. Pavt. with Carbon Black 72' Var. Wide=1.06 Mi.; 9" Cem. Conc. Pavt. (Acc. Rds.)=0.12 Mi.; Asp. Conc., Opt. (Acc. Rds.)=2.44 Mi.; Misc. Work=0.03 Mi.; 2 Hy. Sups. Comp. I-Beams 121.7' and 116.3'; 1 Ped. Overpass I-Beam 129'	$280,000 Plans $100	5,068,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: June 21, 1956

Mackinac Bridge Authority

Advertisement for Proposals
for the
Construction of the Deck Concrete and Asphalt and St. Ignace Approach Viaduct Substructure
for
Mackinac Straits Bridge

The Mackinac Bridge Authority will receive sealed proposals for the construction of Contract No. 3, Deck Concrete & Asphalt and St. Ignace Approach Viaduct Substructure, for the Mackinac Straits Bridge until 10:00 A.M. Eastern Standard Time on the 21st day of June, 1956, at the office of the Authority, 608 Prudden Building, Lansing, Michigan, at which time and place proposals will be publicly opened and read aloud.

The work of Contract No. 3, Division A, includes the construction of the concrete deck and asphalt surfacing for two 23-ft. wide roadways, together with walkways, on the suspension spans and truss span approaches of this bridge.

The bridge consists of the south approach truss spans 5693.5 feet in length from Pier 1 to the south anchorage; the north approach truss spans 3609.5 feet from Pier 34 to the north anchorage; two anchorages 135 feet in length; two backstay spans 472 feet in length, two suspended side spans eighteen hundred (1800) feet in length, and the main suspended span thirty-eight hundred (3800) feet in length.

The principal items of work include:

	Approximate Quantities
Bituminous Concrete	6,025 Tons
Grade A Concrete	11,540 Cu. Yds.
Lightweight Concrete	2,030 Cu. Yds.
Steel Reinforcement	2,638,000 Lbs.

The work of Contract No. 3, Division B-1, includes the construction of thirteen concrete piers and one concrete abutment, fifty feet on centers on the existing causeway, with the first pier located approximately sixty feet from the outshore end of the causeway and north of the north truss spans. The piers and abutment are each supported on two concrete pile caps resting on piles driven to rock bearing.

The principal items of work include:

	Approximate Quantities
Earth Excavation	1,500 Cu. Yds.
Grade A Concrete	1,300 Cu. Yds.
Steel Reinforcement	200,000 Lbs.
Piles	
Alternate A. 12" B.P. 53#	10,320 Lin. Ft.
Alternate B. 14" B.P. 117#	6,360 Lin. Ft.
Alternate C. Cast-in-place Concrete	13,200 Lin. Ft.

The work of Contract No. 3, Division B-3, includes the construction of the Concrete Deck and Asphalt surfacing for the St. Ignace Approach Viaduct.

This structure is a highway beam viaduct extending approximately 700 feet north of the north truss span Pier 34. The viaduct deck consists of two 23-foot concrete roadways with a bituminous concrete surfacing, separated by a two-foot center mall, with curb and sidewalk each side.

The principal items of work include:

	Approximate Quantities
Bituminous Concrete	300 Tons
Grade A Concrete	930 Cu. Yds.
Steel Reinforcement	163,000 Lbs.

Plans, Specifications, Proposal Form and Contract Documents for the work are on file in the office of the Mackinac Bridge Authority and in the office of D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York 6, New York, and may be inspected by prospective bidders during office hours.

Plans Specifications, Proposed Form and Contract Documents may be obtained from D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York 6, New York upon application and payment of a fee of twenty-five ($25.00) dollars, fifteen ($15.00) dollars of which will be refunded upon return of the Plans to non-bidders, and all of which will be returned to bidders.

Bids must be made upon the proposal form included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of the Mackinac Bridge Authority for the sum of one hundred thousand ($100,000.00) dollars.

MACKINAC BRIDGE AUTHORITY
Prentiss M. Brown, Chairman
May 31, 1956

U. S. Government

GOVT. OF DIST. OF COL., DEPT. OF HIGHWAYS, May 24, 1956. SEALED PROPOSALS will be recd. in Rm. 404, 499 Pa. Ave., N.W., Wash. 1, D. C. until 2 PM, EDT, June 22, 1956, and then publicly opened and read for constr. of an Underpass on Kenilworth Ave., N.E. at Eastern Ave., (Fed. Aid Proj. UI-500 (1)) consist. of 58,900 cu. yds. excavation, 1,656 lin. ft. stormsewer, 1,057 cu. yds. Class BH concrete in structures, 920 cu. yds. of prestressed concr. in deck beams, 400,000 lbs. of reinf. steel, 24,650 lbs. structural steel, 85,450 lbs. high tensile steel wire, 33,800 sq. ft. stone masonry facing, and 1,880 lin. ft. aluminum railing. Proposal forms, plans and specs. obtainable from Supervisor, Contr. & Bond Section, Procurement Office, D. C. Room 406, 499 Penn. Ave. N.W., upon deposit of a certified check for $20.00 per set, payable to Collector of Taxes, D. C. (Tel. NA 8-6000, Ext. 2378).

OFFICIAL PROPOSAL

RATE: $2.10 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

U. S. Government

GOVERNMENT OF IRAQ. DEVELOPMENT BOARD AND MINISTRY OF DEVELOPMENT. IRAQ HOUSING PROGRAMME. Preannouncement of coming tenders for housing projects. 1. The Development Board and the Ministry of Development of the Government of Iraq would like to bring to the notice of contracting firms interested in housing constructions that several tenders will be advertised for such constructions. 2. Advertising will start from May, 1956. Iraq/and/ or foreign contractors may participate. 3. The works will include construction of houses of different types and construction of community facilities, viz. pedestrian and vehicular roads, water supply, sewerage and, in certain cases, electricity supply. 4. The tendering period will vary between 9 and 13 weeks according to the size of each contract. 5. Tenders will only be accepted from persons or firms who have had previous experience in works of similar nature and magnitude. To this end, participating contractors will be requested to submit, together with their tenders, a letter of capacity and articles of association. 6. A schedule of the coming tenders is the following:—a. Contract SPA/6 (1956): Western Baghdad Development, Sector 4, Experimental Housing Scheme for the Construction of 200 two-story houses. Architectural drawings will be requested to suggest the system and method of construction. b. Contract SPA/7 (1956): Construction of 1200 houses and community facilities in Mosul. c. Contract SPA/8 (1956): Construction of 2000 houses and community facilities in Basrah. d. Contract SPA/9 (1956): Western Baghdad Development, Sectors No. 8 and 13. Construction of 2400 houses and community facilities. e. Contract SPA/10 (1956): Construction of 1000 houses and community facilities at Kirkuk. f. Contract SPA/11 (1956): Construction of 400 houses and community facilities near Mosul for Mosul Cement Factory. g. Contract SPA/12 (1956): Construction of 400 houses in Mosul for Mosul Sugar Plant. 7. Further details regarding these coming tenders may be obtained from the Ministry of Development, Directorate General Technical Section 5, Southgate, Baghdad, Iraq, or from the Consulting Engineers at the following addresses: a. Doxiadis Associates, Consulting Engineers, 10, E. Venizelou Street, Athens, GREECE. b. Doxiadis Associates, Consulting Engineers, 29/2, 83, Sa'adoon, Baghdad, IRAQ. The Minister of Development.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4712) will be received at Denver, Colorado, until July 3, 1956, for furnishing the following vertical-shaft hydraulic turbines: One 2,666 hp, 450 rpm, and two 2,900 hp, 514 rpm, for Wanship and Gateway Power Plants, Weber Basin Project, Utah. Delivery is desired within 450 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Official Proposals Columns

of

ENGINEERING NEWS-RECORD

are MUST reading, each week, for contractors, engineering-construction companies, equipment and materials manufacturers, all over the United States.

. . . and used regularly for over 50 years by government, state, county and municipal departments for advertising bids.

Official Proposal Division

ENGINEERING NEWS RECORD

Address: New York 36, N. Y.

OFFICIAL PROPOSALS

Bids: June 22, 1956

Notice of Letting of Drain Contract

NOTICE OF LETTING OF DRAIN CONTRACT FOR DEEPENING, WIDENING, TILING AND RELOCATING THE READY STORM WATER DRAIN IN DEARBORN TOWNSHIP AND VILLAGE OF INKSTER, WAYNE COUNTY, MICHIGAN

NOTICE IS HEREBY GIVEN, THAT I, CHRISTOPHER J. MULLE', County Drain Commissioner for the County of Wayne, State of Michigan, will now and until 11:00 o'clock in the forenoon of the 22nd day of June, A. D. 1956, in the office of the Wayne County Drain Commissioner, 3523 Cadillac Tower, Detroit 26, Michigan, proceed to receive sealed bids for the deepening, widening, tiling and relocating of a certain drain known and designated as the "READY STORM WATER DRAIN", located and established in the Township of Dearborn and Village of Inkster, in said County, at which time bids will be publicly opened and read by Christopher J. Mulle', The Wayne County Drain Commissioner.

Said drain consists of two sections. All stations are 100 feet apart.

SECTION I

A drain beginning at the main channel of the Lower Rouge River, East of Blackstone Avenue in the Village of Inkster and ending at Station 50 + 02 and including the following items:

241 Lin. ft. of 8 ft. 10 inch x 6 ft. 1 inch C.M.P.
4179 Lin. ft. of 90 inch C-76 Table II Conc. Pipe.
577 Lin. ft. of 84 inch C-76 Table I Conc. Pipe.
1 Transition Section 5 ft. in length more or less between 8 ft. 10 inch x 6 ft. 1 inch C.M.P. and 90 inch C-76—Table II Conc. Pipe.
1 Avondale Connection including 25 Lin. ft. of 24 inch C.M.P. and 1 manhole (M.H. 26) and 127 lin. ft. of 12 inch C.M.P.
1 Montecello Connection including 35 Lin. ft. of 12 inch C.M.P.
1 Amherst St. Connection including 20 Lin. ft. of 18 inch C.M.P. and 1 manhole (M.H. 27).
1 Biltmore St. Connection including 30 Lin ft. of 12 inch C.M.P.
1 Cherry Hill Connection including 20 Lin ft. of 24 inch C.M.P. and 1 inlet headwall and 60 Lin. ft. of 12 inch C.M.P.
5 Standard M.H.'s. with stubs (M.H. 1, 3, 4, 5 and 6).
1 Standard M.H. (M.H. 2).
1 Headwall at Rouge River.

SECTION II

A drain beginning at Station 50 + 02 in the main Trunk Drain and ending at Station 63 + 84 at a point in John Daly Road 10 feet more or less North of the Northline of Dearborn Manor Subdivision and including the following items:

8 Lin. ft. of 84 inch C-76 Table I Conc. pipe.
733 Lin. ft. of 72 inch C-76 Table I Conc. pipe.
641 Lin. ft. of 66 inch C-76 Table I Conc. pipe.
1 Standard M.H. with stubs (M.H. 8).
1 M.H. (M.H. 7).
1 M.H. (M.H. 9).

ARM NO. 1

A drain beginning at Station 50 + 10 of Trunk No. 1 and ending at Station 27 + 70 at a point in Jim Daly Road at Wilson and including the following items:

1512 Lin. ft. of 66 inch C-76 Table I Conc. Pipe.
800 Lin. ft. of 60" C-76 Table I Conc. Pipe.
458 Lin. ft. of 54" C-76 Table I Conc. Pipe.
2 Std. M. H. with stubs (No. 11, 15).
3 Std. M.H. (No. 10, 13, 14).
1 M.H. (No. 12).

ARM NO. 2

A drain beginning at the upper end of Trunk Drain No. 1 and ending at Station 27 + 26 at a point in Wilson at Amboy and including the following items:

1547 Lin. ft. of 60 inch C-76 Table I Conc. Pipe.
1179 Lin. ft. of 54 inch C-76 Table I Conc. Pipe.
6 Std. M.H. with stubs (M.H. No. 19, 20, 22, 23, 24, 25)
M.H. No. 16.
M.H. No. 17.
M.H. No. 18.
MH. No. 21.

The Drain Commissioner reserves the right to reject any or all bids and to waive any informalities in bids, also to award contracts either on the basis of single sections or two sections as one project. Bids will be considered on the basis of individual sections or for two sections as one project.

Said job will be let in accordance with the diagram now on file with the other papers pertaining to said Drain in the office of the County Drain Commissioner for the County of Wayne, to which reference may be had by all parties interested, and bids will be made and received accordingly. Contracts will be made with the lowest responsible bidders giving adequate security for the performance of the work, reserving to myself the right to reject any and all bids or proposals, and/or to adjourn such letting to such time and place as I shall publicly announce.

The Drain Commissioner shall have the right to hold all bids for a period of sixty days after the opening thereof. No bidder shall have the right to withdraw his bid during such time.

The Drain Commissioner shall, within the period of sixty days herein providing for the holding of bids, obtain the approval of the Wayne County Board of Auditors to the letting of the contract to the lowest responsible bidder, and shall notify such bidder of his award of the contract. The Drain Commissioner shall be given ninety days from the date of notification to the contractor of the acceptance of his bid to sell bonds in an amount sufficient to pay for this project, it being understood that if the Drain Commissioner shall not have marketed bonds in an amount sufficient to pay for this project within such ninety day period, no contract shall be executed. If within such ninety day period the Drain Commissioner shall successfully sell bonds in an amount sufficient to pay for the project, the Drain Commissioner shall forthwith notify the successful bidder of such sale and an agreement awarding the contract to the successful bidder shall be executed within ten days from the date of notice of the sale of bonds. The bid, of the successful bidder, and the bond securing the same, shall remain in full force and effect until the contract is executed. If the bonds hereinbefore required to be sold are not marketed within the period provided above, or notice of such sale is not given by the Drain Commissioner to the successful bidder within the specified time, the bid shall be deemed to be null and void and the bid deposit shall be returned to the successful bidder.

The ninety day period provided above for the sale of bonds and the giving of notice thereof may be extended from time to time by mutual agreement between the successful bidder and the Drain Commissioner.

The successful bidder shall not be required to execute performance bond, material lien bond, or provide the insurance herein otherwise required until he shall first have been notified of the sale of the bonds by the Drain Commissioner, and upon receipt of such notice, the successful bidder shall be required to execute and deposit such bonds and insurance as are required by the terms of the contract at the time of the execution thereof.

Copies of the plans and specifications may be secured from the office of the Drain Commissioner of the County of Wayne, Michigan at 3523 Cadillac Tower, Detroit 26, Michigan.

Any person desiring to bid on any of the above mentioned work will be required to deposit with the County Drain Commissioner a certified check or bank draft payable to the Drain Commissioner of the County of Wayne, Michigan, or a satisfactory bid bond executed by the bidder and a Surety Company, in an amount equal to five per cent (5%) of the bid as a guarantee that he will enter into contract and furnish the required bond at the time and in the manner hereinbefore provided.

A deposit of Fifteen Dollars ($15.00) will be required for the entire set of plans and specifications, which said deposit will be refunded upon the return of said plans and specifications in good condition within 15 days after the award of the contract. The payments for the above-mentioned work will me made as follows: IN CASH, FROM THE RECEIPTS OF THE SALE OF BONDS. Contractor may draw up to 80% of work completed from time to time and upon approval of the engineer.

Taxes will be spread in thirty (30) installments. First installment due and payable the 1st day of December, 1956.

Dated this 29th day of May, A. D. 1956.

CHRISTOPHER J. MULLE'
Wayne County Drain Commissioner

OFFICIAL PROPOSALS

contracts either on the basis of single sections or two sections as one project. Bids will be considered on the basis of individual sections or for two sections as one project.

Said job will be let in accordance with the diagram now on file with the other papers pertaining to said Drain in the office of the County Drain Commissioner for the County of Wayne, to which reference may be had by all parties interested, and bids will be made and received accordingly. Contracts will be made with the lowest responsible bidders giving adequate security for the performance of the work, reserving to myself the right to reject any and all bids or proposals, and/or to adjourn such letting to such time and place as I shall publicly announce.

The Drain Commissioner shall have the right to hold all bids for a period of sixty days after the opening thereof. No bidder shall have the right to withdraw his bid during such time.

The Drain Commissioner shall, within the period of sixty days herein providing for the holding of bids, obtain the approval of the Wayne County Board of Auditors to the letting of the contract to the lowest responsible bidder, and shall notify such bidder of his award of the contract. The Drain Commissioner shall be given ninety days from the date of notification to the contractor of the acceptance of his bid to sell bonds in an amount sufficient to pay for this project, it being understood that if the Drain Commissioner shall not have marketed bonds in an amount sufficient to pay for this project within such ninety day period, no contract shall be executed. If within such ninety day period the Drain Commissioner shall successfully sell bonds in an amount sufficient to pay for the project, the Drain Commissioner shall forthwith notify the successful bidder of such sale and an agreement awarding the contract to the successful bidder shall be executed within ten days from the date of notice of the sale of bonds. The bid, of the successful bidder, and the bond securing the same, shall remain in full force and effect until the contract is executed. If the bonds hereinbefore required to be sold are not marketed within the period provided above, or notice of such sale is not given by the Drain Commissioner to the successful bidder within the specified time, the bid shall be deemed to be null and void and the bid deposit shall be returned to the successful bidder.

The ninety day period provided above for the sale of bonds and the giving of notice thereof may be extended from time to time by mutual agreement between the successful bidder and the Drain Commissioner.

The successful bidder shall not be required to execute performance bond, material lien bond, or provide the insurance herein otherwise required until he shall first have been notified of the sale of the bonds by the Drain Commissioner, and upon receipt of such notice, the successful bidder shall be required to execute and deposit such bonds and insurance as are required by the terms of the contract at the time of the execution thereof.

Copies of the plans and specifications may be secured from the office of the Drain Commissioner of the County of Wayne, Michigan at 3523 Cadillac Tower, Detroit 26, Michigan.

Any person desiring to bid on any of the above mentioned work will be required to deposit with the County Drain Commissioner a certified check or bank draft payable to the Drain Commissioner of the County of Wayne, Michigan, or a satisfactory bid bond executed by the bidder and a Surety Company, in an amount equal to five per cent (5%) of the bid as a guarantee that he will enter into contract and furnish the required bond at the time and in the manner hereinbefore provided.

A deposit of Fifteen Dollars ($15.00) will be required for the entire set of plans and specifications, which said deposit will be refunded upon the return of said plans and specifications in good condition within 15 days after the award of the contract. The payments for the above-mentioned work will me made as follows: IN CASH, FROM THE RECEIPTS OF THE SALE OF BONDS. Contractor may draw up to 80% of work completed from time to time and upon approval of the engineer.

Taxes will be spread in thirty (30) installments. First installment due and payable the 1st day of December, 1956.

Dated this 29th day of May, A. D. 1956.

CHRISTOPHER J. MULLE'
Wayne County Drain Commissioner

OFFICIAL PROPOSALS

(Continued from preceding page)

Bids: June 22, 1956

Niagara Falls Bridge Commission

NIAGARA FALLS, NEW YORK

NOTICE IS HEREBY GIVEN that sealed bids for painting the Superstructure of the Steel Arch Span of the Rainbow Bridge over the Niagara River between Niagara Falls, New York and Niagara Falls, Ontario will be received by the Niagara Falls Bridge Commission at its offices in Niagara Falls, New York until Three O'clock P.M. E.D.T. on June 22, 1956 and immediately thereafter will be publicly opened and read aloud. Bids shall be made on the prescribed forms and shall be enclosed in an opague sealed envelope addressed to the Commision and endorsed with the name of the bidder and the title "Bid for the Painting of the Rainbow Bridge."

Prices for the work shall be stated in United States money. Because of the International aspect of the work, the bidder shall inform himself of requirements pertaining to the employment of labor and ordinances which may affect the work and the Contractor's operations under the Contract.

The Bidder shall submit with his proposal a list of structures similar to the Rainbow Bridge which he has successfully painted during the past seven years, together with the name, title and address of the owner's representative who was directly in charge of such work so that the Commission may ascertain to its satisfaction that the bidder is well qualified to undertake the work required under the Contract.

Each proposal shall be accompanied by bid security in the form of a certified check payable in United States monies upon a State or National Bank or Trust Company, drawn to the Order of the Commission and in an amount not less than five (5) percent of the Guaranteed Upset Price bid.

The work will be awarded, if an award is made, within thirty days after the opening of bids. The work shall be completed on or before September 30, 1956. Liquidated damages in the amount of $100 will be assessed for each and every calendar day the Contractor is in default in completing the Contract. The Commission reserves the right to reject any or all bids.

Contract Documents including Information For Bidders, Proposal, Contract Agreement, Contractor's Bond and Detailed Specifications may be obtained from the Commission upon making a deposit in the amount of Ten (10) Dollars. The deposit will be refunded in full upon the return of the documents in good condition.

Niagara Falls Bridge Commission
By C. Ellison Kaumeyer
General Manager

June 4, 1956

Bids: June 26, 1956

Contract O & M - 360

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
BAYONNE BRIDGE
PAVEMENT RESURFACING
ON
NEW JERSEY APPROACH SPAN

Sealed proposals for furnishing all labor, material and equipment for resurfacing pavement on the New Jersey approach span of the Bayonne Bridge will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, until 11:00 A.M., Tuesday, June 26, 1956, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt in duplicate will be issued. The duplicate copy of the receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York,
June 14, 1956

EMPLOYMENT OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you c/o this publication, Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Mechanical and Piping Erection Superintendent for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1719, Engineering News-Record.

Engineers experienced in design and supervision of construction to work as resident engineers or prepare plans for water and sewer systems; also, architects for preparation of plans for general building work. State experience, age, salary required, when can report, and give references. Reply P-1800, Engineering News-Record.

Designers & Draftsmen—Structural, electrical, piping air cond., & arch. industrial buildings and power plants. Marbarry, 120 Greenwich St., N.Y.C. RE-2-3749.

Superintendents, mechanical engineers and estimators needed by rapidly expanding mechanical contractor, specializing in industrial construction. Excellent opportunity for advancement in all fields. Submit resume of experience and availability with initial reply. P-1880, Engineering News-Record.

Chief estimator with well established Central Pennsylvania General Contractor. Send full information on experience, education, date available and salary requirements. We are mainly interested in industrial, commercial and institutional work. P-1816, Engineering News-Record.

Instructor—To teach undergraduate courses in applied mechanics. Opportunity to work on graduate degree in any engineering department. Salary depends on qualifications of applicant. Department of Applied Mechanics, University of Kansas, Lawrence, Kansas.

Assistant City Engineer: City of Owosso, Mich. Must be a graduate civil engineer or man with experience in surveying and drafting, with some design knowledge for general municipal engineering. Submit complete resume with salary requirements and earliest date available in first letter to City Engineer, Owosso, Michigan.

Graduate Engineer to become City Engineer in a community of 22,000 population, which is a suburb of the City of Detroit. Engineer will be in charge of the Department and have control of all public works within the city. Need not be registered. Salary open, but in neighborhood $6,500.00 and $7,000.00. Applications to the City Manager, City Hall, 3322 Coolidge Highway, Berkley, Michigan.

Estimator on earth and concrete dams, for permanent position with old established San Francisco construction firm. Send resume in confidence. Our staff knows of this advertisement. Write P-1780, Engineering News-Record.

Engineers on design of water and sewage treatment projects, in long established organization specializing in sanitary engineering and now interested in adding a few men to its permanent personnel. Location, Ohio. Experience in related fields considered applicable. State full information, experience, references. P-1868, Engineering News-Record.

Mechanical and Piping Detailer for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1715, Engineering News-Record.

Engineers one or two years experience in structural design or recent graduates. Consulting engineers office Newark, N. J. Give education, experience and salary. P-8890, Engineering News-Record.

Architect, or Engineer with architectural background, with comprehensive knowledge of prefab panel or "skinwall" construction. Some sales and promotion experience desirable. Age requirement open, but 30-40 years preferable. Position with National Manufacturer of Building Materials involves introduction and promotion activities. Real opportunity for right man. Salary commensurate with position. Reply P-1937, Engineering News-Record.

POSITIONS VACANT

General Superintendent—experienced in steel cofferdaming, piling and reinforced concrete river work in Philadelphia. State references, salary, age and when can report. P-1907, Engineering News-Record

Superintendent—with engineering background —to become associated with a growing excavating-paving and flood control contractor in Western New York. As field superintendent the right man can build his own future. Sheridan Construction Corp., 3580 Sheridan Drive, Buffalo 21, New York.

Estimator for Commercial, institutional and Industrial Building Construction by long established and well rated Central Pennsylvania Construction Organization. Must be experienced and capable. Give full information —covering experience, education, age, salary, references and personal data in letter of application. P-1939, Eng. News-Record.

Line and Grade Chief—First Class Man of experience who can read plans thoroughly— 2 yr job Jersey Area. Good pay for the right man. Roscoe Eng. Corp., 1107-19th St. N.W. Wash. 6, D. C.

Structural Engineer—Registered Civil Engineer for prestressed concrete plant under construction in Western Penna. Building and Bridge design experience required. Prestressed concrete design, construction and sales experience desirable but not necessary. Prefer applicant aged 30 to 40. In first letter submit complete resume of experience, education, references, salary requirements and date available. Only applicants interested in a permanent position in the prestressed concrete field and capable of growing with the industry need apply. Please include telephone number. Reply to P-2011, Engineering News-Record.

Sales Manager for steel buildings. Requirements are: young, aggressive, engineering training, experienced in establishing dealerships and selling building products. Send resume in confidence to William Pentin, The Parkersburg Rig and Reel Company, P. O. Box 1160, Parkersburg, W. Va.

(Continued on opposite page)

SUPERINTENDENT WANTED

For gravel plant involving dredging and barging materials. Also stone quarry operations. State full experience, age, list references, and salary expected.

FRED R. McKENZIE & CO.
Room 405, Bondi Building, Galesburg, Ill.

ENGINEERS
DESIGNERS DRAFTSMEN

Expanding and progressive Consulting Firm requires graduate civil engineers, designers and draftsmen with experience in highways, bridges, airfields and soils. Permanent positions with excellent working conditions and liberal company benefits. Send full resume: Berger Associates, Inc., Consulting Engineers, Hall Building, Second and Locust Streets, Harrisburg, Pennsylvania.

Wanted—CIVIL ENGINEERS

Experienced in Municipal Engineering: Principal Civil Engineer, Senior Engineer, 3 Civil Engineers. Liberal benefits including annual wage increase, Longevity, Paid Vacation, Sick Leave, Retirement Plan with Social Security, Group Life Insurance, Sick and Hospital benefits.
Contact Superintendent of Public Works
Ann Arbor, Michigan

POSITION AVAILABLE

Graduate Structural Engineer with experience in railroad B&B department for educational work with railroads. Age 30 to 40 years. Headquarters Chicago. Travelling about one half the time. Opportunity for advancement. Salary Open.

P-2008, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

CIVIL AND SANITARY ENGINEERS

Civil Engineer for complete supervision of sanitary sewer and water supply for rapidly developing area. Excellent opportunity and salary. Also two experienced sanitary engineers to work with above as assistants. Please state full qualifications, experience, references

P-2025, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

(Continued from opposite page)

Superintendent, dockbuilding, water work. Driving piles, timber construction. Work in New York City. Profit sharing vigorous young company. Write Room 219-48 Mamaroneck Avenue, White Plains, New York. Call WH 6-1950.

Assistant Professor and Instructor in Civil Engineering. Assistant Professor to take charge of surveying—highway course sequence and surveying camp. Eastern metropolitan college, start September 1, 1956. Reply P-2004, Engineering News-Record.

Municipal Engineer must be registered or able to obtain registration in Ohio; experience in Municipal work desirable. Recent graduates also needed as E.I.T.'S; salary is dependent upon experience and qualifications. Apply 500 Municipal Building, City Engineers, Dayton 2, Ohio.

Estimator-Superintendent. Experienced on Sewer work. Civil Engineer preferred. Midwest location. Salary and percentage of profits to right party. P-2013, Engineering News-Record.

Engineering Assistant, for Municipal Work. Surveying and drafting experience required. Paid vacation, sick leave, retirement plan. Salary Range $3910 to $4947. Apply to Borough Engineer, Borough Hall, Madison, N. J.

Assistant Chief Draftsman: Established Southern structural steel fabricating company desires to employ permanently a thoroughly qualified man to act as assistant to chief draftsman. Duties supervisory, including planning of drafting work. Must be able to obtain results and to be congenial with average draftsman group. Employment benefits such as insurance, paid vacation, pension plan, etc. Reply in full, giving complete experience, age, health, marital status, references who know your ability. Excellent opportunity for steady and reliable man with extensive experience. P-1977, Engineering News-Record.

Executive Secretary for Contractors Association in Southern Midwest section of the United States. Immediate opening. Labor relations experience very desirable. P-1972, Engineering News-Record.

Sales Engineer-Structural Engineer with proven sales background in masonry and primarily interested in sales. Must be willing to travel in East from Upstate New York office. National manufacturer of steel product used with masonry desires top-notch sales engineer to work with established outlets in sale and promotion of product from four plants located in East. Salary open. Furnish business and personal resume, salary requirements, availability first letter. P-1975, Engineering News-Record.

Assistant Superintendent and Civil Engineer for road builder and heavy construction contractor. Must have some experience with highway department work, and knowledge of roadway construction. Position is as Assistant to General Superintendent presently looking after five roadway projects. Initial assignment in the State of Maryland. P-1982, Engineering News-Record.

College Teaching position open to teach civil engineering and mechanics courses other than structural. Rank and salary based on applicant's qualifications. Write: Head, Civil Engineering Department, Clarkson College of Technology, Potsdam, New York.

Wanted . . . Bridge Superintendent to take complete charge of bridge and foundation work for long established New England contracting firm operating in New York and New England. Salary commensurate with experience and ability. P-1980, Engineering News-Record.

Construction Mgr. for expanding gen. contractors office. Grad. CE. Minimum 10 yrs. experience. Labor following necessary. Send resume; state salary. P-1949, Engineering News-Record.

EMPLOYMENT SERVICE

Overseas Jobguide to most active constructors-engineers, oil co's., gov't and UN agencies hiring for foreign projects. Send $1. Cove-McKane Int'l. GPO Box 126K NYC.

Salaried personnel. $5,000-$30,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, P. O. Box 674, Manchester, Vermont.

(Continued on page 152)

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant | **Civil Service Opportunities . . .** | **Employment Agencies**
Positions Wanted | **Selling Opportunities Wanted** | **Employment Services**
Part Time Work | **Selling Opportunities Offered** | **Labor Bureaus**

NATIONAL COVERAGE

DISPLAYED —RATES— **UNDISPLAYED**

The advertising rate is $28.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

$2.10 per line, minimum 3 lines. To figure payment count 5 average words as a line.

Position Wanted ads are ½ of above.

Box Numbers count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW ADS or inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36, N. Y.

Engineers Architects

Highway—Bridge Designers—Draftsmen
Soils Engineer
Irrigation Designer
Consulting Engineer (Irrigation)
Architectural Designers—Draftsmen
Ink Tracers—Computors
Civil Engineering Draftsmen

Air Mail Resume TO R. L. SHAW, *Personnel Director*

MICHAEL BAKER, Jr., Inc.

BAKER BLDG. *Consulting Engineers* ROCHESTER, PA.

Construction ENGINEERS

FOREIGN EMPLOYMENT

Graduate Electrical, Mechanical, Civil or Chemical Engineers with minimum 10 years' experience supervising construction of industrial buildings, oil processing and oil handling facilities. Engineering degree essential. To assist in constructing expanding company facilities of major foreign operating oil company located in Saudi Arabia. Generous salary plus living allowance: liberal all-inclusive benefit program.

Write giving full particulars regarding personal history and work experience.

Recruiting Supervisor, Box 146

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

STRUCTURAL ENGINEERS DESIGNERS DRAFTSMEN

Prefer several years' experience in bridges, buildings, highway structures or hydro structures. Will consider lesser experience with good educational background.

We are professional engineers and desire men who wish long range employment with good opportunity to advance and develop in professional engineering. Occasional openings in construction supervision and inspection.

Paid vacation, sick leave, holidays, overtime. Employee Benefits Plan furnishes retirement income and insurance. Blue Cross. Moving allowance. Openings available in St. Louis and San Francisco.

Please write fully to

SVERDRUP & PARCEL, INC.
Engineers - Architects
915 Olive St. Louis 1, Mo.

STRUCTURAL DETAILERS

Permanent positions for structural draftsmen having at least three years experience, with structural steel fabricators, on bridge and building work. Modern air-conditioned office with all employee benefits.

ST. JOSEPH STRUCTURAL STEEL CO.
Box 68, Station A St. Joseph, Mo.

BRIDGE and HIGHWAY ENGINEERS

For responsible positions in Rochester, N. Y., Syracuse, N. Y., and in Columbus, Ohio. Write in confidence to

ERDMAN, ANTHONY & HOSLEY
600 Foote Bldg. Syracuse 2, N. Y.

NEED TRAINED OPERATORS?

for Crawler-tractors, tractor-drawn and self-propelled scrapers, motorgraders or cranes?

Our students are trained in operation, care, maintenance and accepted safety practices.

We will send you our curriculum on request.

Write for list of our qualified graduates.

NATIONAL SCHOOL OF HEAVY EQUIPMENT OPERATION
P. O. Box 8243 Charlotte, N. C.

HIGHWAY ENGINEERS
DESIGNERS
DRAFTSMEN
Drainage Engineers

FOR OFFICE WORK IN ST. LOUIS ON HIGHWAYS EXPRESSWAYS AND ASSOCIATED CIVIL WORKS

- *Permanent employment for qualified men*
- *Ample opportunity for advancement based on merit*
- *Generous transportation & moving allowances*

Plus: Employee Benefit and Retirement Plan, Paid Vacations, Holidays, Sick Leave. Blue Cross available.

PLEASE WRITE FULLY TO OR INQUIRE AT

SVERDRUP & PARCEL ENGINEERING CO.

1134 LOCUST ST. ST. LOUIS 1, MO.

AUTOMOTIVE ENGINEER

Graduate M.E. with minimum 5 years' experience involving design, selection or preparation of specifications for the construction and use of heavy, medium and light off-road automotive equipment. For work in Company's Equipment Engineering Department. Will prepare specifications for manufacture, economic and engineering analysis for selection and guidance for tests and inspection of purchased equipment. Salary commensurate with qualifications.

Write outlining personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 132

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

CONSTRUCTION MANAGER

Experienced Engineer and Contractor with Executive Ability

Approx. 15 yrs experience all phases construction and installation equipment for eight Steam Electric Stations plus Transmission Lines. Part of extensive development program for large long established group of Electric Utilities. Location Latin America. Headquarters large city. Applicant must have proven administrative ability and be cost and system conscious. Reply stating age, education, experience and personal particulars.

AMERICAN & FOREIGN POWER CO. INC. and SUBSIDIARIES
2 Rector Street, New York 6, New York
21st Floor DI 4-4400 Ext 8494

Wanted

ENGINEER—ESTIMATORS

With thorough knowledge and sound experience in large general building construction work from estimating to completion of project for well-established expanding and progressive firm operating in Southern California. Graduate engineer preferred—age 30 to 40 years. Reply giving complete qualifications including salary desired.

FORD J. TWAITS CO.
507 So. Bixel St.
Los Angeles 17, California

DESIGN ENGINEERS DRAFTSMEN

Excellent opportunity for permanent positions with a top firm which is rapidly expanding in the progressive pulp and paper industry. Location in mountain area of western Virginia.

DESIGN ENGINEERS—M.E., C.E., or equivalent education with three or more years experience, not necessarily paper mill, for piping, structural, plant layout, and design.

DRAFTSMEN—College degree not required but must have at least three years experience, not necessarily paper mill.

Complete resume including education, experience, present salary, and late photograph if available should be sent to:

HAROLD E. MILLER
Technical Director
West Virginia Pulp & Paper Company
Covington, Virginia

SALES ENGINEER

Packaging equipment, nationally known manufacturer. Able to survey and recommend equipment needs, various products. Engineering grad. industrial or mechanical preferred. Experience in cement, feed, allied industries desirable. Will consider substitution experience for education; company car furnished; salary commensurate with qualifications.

Send full resume to

ST. REGIS PAPER CO.
18 S. Michigan Ave., Chicago 3, Illinois.

BUSINESS MANAGER
(ACCOUNTANT)

Opportunity for mature man directing office, accounting, cost and reimbursement activities for long-established construction firm in Central America. Must be thoroughly experienced in construction accounting and office management. Initiative, drive and fluent Spanish essential. Compensation commensurate with experience. Send experience history, references, statement of availability and salary requirements in first letter

to

Apartado 147
Ciudad Trujillo, Dominican Republic

ENGINEER
(CIVIL—OVERSEAS)
HIGHWAY MATERIALS and TESTING ENGINEER

Position: In charge of modern highway testing laboratory and materials survey in Near East.

Requirements: 15-20 years experience. Ability to organize and direct a country wide materials survey and train personnel in testing operations.

Top salary—good living conditions—liberal benefits including paid transportation for wife.

P-1812, Engineering News-Record
330 West 42 St., New York 36, N. Y.

SALES ENGINEERS

A major steel company has need for sales engineers to promote and sell fabricated products in middle Atlantic states. Excellent opportunities for men 25 to 30 years old with engineering background and a desire for sales work. Attractive starting salary with company car, expenses and bonus plan.

P-8324, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED
HEAVY CONSTRUCTION SUPERINTENDENT

Capable of estimating and taking charge on flood control, bridges, and concrete sewers in Philadelphia vicinity. State education, age, experience, salary and availability. Only experienced top men should apply.

P-1904, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

GENERAL MANAGER and ESTIMATOR

For Sewer and Water Line, Treatment Plant Construction. South Florida experience essential. Aggressive with proven qualifications. Able to coordinate inside and outside. Good salary and bonus opportunity.

MARBAUGH CONSTRUCTION CO
211 N.W. Fifth St. Ft. Lauderdale, Fla
JAckson 2-8551 Res. JA 3-9847

DESIGN ENGINEERS
DESIGN DRAFTSMEN

If you are interested in:

- HIGHEST EARNINGS
- OVERTIME WORK
- PERMANENT EMPLOYMENT
- ADVANCEMENT OPPORTUNITIES
- IDEAL WORKING CONDITIONS
- WELL-LIGHTED, AIR-CONDITIONED OFFICES
- MANY OTHER BENEFITS

Please be sure to contact or see

ARTHUR G. McKEE & CO.

With Engineering Offices in
CLEVELAND, OHIO and
UNION, NEW JERSEY

McKee is a 50-year-old Engineering and Construction firm doing business on a world-wide basis.

We have interesting, well-paying positions for

DESIGNERS AND ENGINEERS

qualified in

PIPING	PRESSURE VESSELS
CONCRETE	EQUIPMENT SPECS.
STRUCTURAL	ARCHITECTURAL
ELECTRICAL	MECHANICAL

DESIGN DRAFTSMEN AND DRAFTSMEN

qualified in:

PIPING	ELECTRICAL
CONCRETE	STRUCTURAL
ARCHITECTURAL	

Refinery, Chemical, Blast Furnace, Steel and Sintering Plant, Industrial or Office Building design or drafting experience desirable but not necessary.

The expanding McKee organization, with three engineering divisions, Refinery, Metals and Industrial, offers many interesting opportunities in these highly-paid fields. Investigate the opportunities McKee can offer you. Please see or contact

EDWARD A. KOLNER

ARTHUR G. McKEE & CO.

2300 Chester Avenue, Cleveland 1, Ohio
TOwer 1-2300

ESTIMATORS

BUILDING
ELECTRICAL

Immediate permanent positions are available in our Cleveland, Ohio office for applicants who have an engineering degree or equivalent in design and/or field experience. In addition must have take-off and pricing experience on all types of industrial and commercial buildings, and/or electrical installations.

These positions offer an opportunity to become associated with one of the country's foremost industrial engineering and construction comstruction companies. In addition to a good starting salary we offer excellent working conditions with paid vacations, sick leave accrual plan, company-sponsored insurance plan and overtime based on current 48 hour work week.

All replies will be treated confidential and arrangements will be made to interview selected applicants. Please submit complete reume stating experience, education, salary required and date available to:

P-1877, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

BECHTEL

ENGINEERS
DESIGNERS

MECHANICAL—

Design experience in one or more of the following fields:

Refinery and Chemical Plant Processes, Steam Power Plants, Hydro-Electric Projects, Instrumentation and Controls, Materials Handling Equipment, Metallurgical Process Equipment such as metallurgical furnaces, kilns, crushers, or related heavy machinery, heating and ventilating, or industrial plant layout.

ELECTRICAL—

Responsible design experience on panel boards, industrial controls, power distribution or lighting.

STRUCTURAL—

Design or detailing experience in structural steel and/or re-inforced concrete for Petroleum Refineries, Steam Power, Hydro Electric, or industrial projects.

PIPING—

Designers with drafting and layout on high temperature high pressure piping.

Immediate openings in our

SAN FRANCISCO
and
LOS ANGELES OFFICES

LIBERAL RELOCATION ALLOWANCES

Send Resume:

5 West 45th St. New York 17, N. Y.
220 Bush St., San Francisco, Calif.

Confidential interview can also be obtained at: Scanlon Building, Houston, Texas, or Roosevelt Building, Los Angeles, Calif.

BECHTEL CORPORATION

Engineers - Constructors

ENGINEERS

Long established firm of consulting engineers with world-wide practice needs both beginners and experienced civil, electrical, mechanical, and foundation engineers for interesting work on large dams, power-plants, river control works and highways. Permanent positions. Liberal employe benefits. Starting salaries dependent on qualifications. Please send complete resume to Hugo Niemi, Personnel Manager.

HARZA ENGINEERING COMPANY
400 W. Madison St.
Chicago 6, Ill.

INDUSTRIAL ENGINEERS

College graduates with minimum 6 years' work experience in industrial engineering, cost analysis or related activities. To provide industrial engineering services ranging in scope from shop layout to organizational changes in major oil producing operations.

Write, giving full particulars regarding personal history and work experience. Please include your telephone number.

Recruiting Supervisor, Box 93

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

ENGINEERS—DESIGNERS—DETAILERS

for work on

BRIDGES AND HIGHWAYS

Permanent Positions for Experienced Men and New Graduates in our CINCINNATI, OHIO, and LANSING, MICHIGAN, Offices.

Paid vacations and holidays, insurance and retirement plan.

Please give detailed personal and experience record, references and salary expected in application letter.

Hazelet & Erdal, Consulting Engineers
Dixie Terminal Bldg.
Cincinnati 2, Ohio

HIGHWAY ENGINEERS
for work in
New Jersey and New York

Designers, draftsmen, chiefs of party, specification writers — submit complete resume stating education, experience, salary desired and date of availability to

P-1603 Engineering News-Record
330 W. 42 St. New York 36, N. Y.

ENGINEERS
Structural, Highway & Railroad

Salary commensurate with qualifications. Submit resume to

DE LEUW, CATHER & BRILL
202 East 44th Street New York 17, N. Y.

AVAILABLE SHORTLY

Project Engineer or Superintendent for heavy construction, highways, airports, sewer and water, industrial works. Graduate Civil Engineer, 20 years experience both foreign and domestic. Fluent Spanish, and will travel.

PW-1969, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

(Continued from page 149)

POSITIONS WANTED

Construction superintendent, over 20 yrs. broad experience, industrial, institutional and commercial projects. Anywhere. Engineer. Minimum salary $200. PW-1768, Engineering News-Record.

Construction Engineer, 32 BSCE desires overseas employment with family accommodations. Top construction man with wide experiences in heavy construction and industrial buildings. PW-1895, Engineering News-Record.

Energetic engineer, 42, civil graduate. Have supervised large projects as resident engineer six to fifty million in value. Require design or construction assignment in New York, Pittsburgh, Baltimore, Philadelphia, Cleveland, Detroit or Chicago. $9600 minimum. Experience on pulpmills, steam plants, large hangers, water and sewerage, airports, highways. PW-1911, Engineering News-Record.

Structural Engineer, licensed graduate, 30 years diversified design, and construction experience in subways, waterfronts, chemical plants, power plants, etc., available for responsible position. PW-1930, Engineering News-Record.

Superintendent, C.E. and Surveyor, 44, married, 22 yrs. field and office experience in heavy construction, mainly highways, railroads, bridges, irrigation and drainage. Worked on 3 continents. Fluent Spanish, French, German, Italian. Good organizer, desires position with progressive contractor or consultant, foreign or domestic. PW-1940, Engineering News-Record.

Construction Engineering Ohio license 30 years experience. Prefer sewage or water plants available at once. PW-2020, Engineering News-Record.

Executive Engineer—Designer—Draftsman— Arrangements intimately acquainted with several trades. Lic. Eng'r. in State of New York. Originally qualified as journeyman in 5 trades. Very cost conscious and reliable. Prefer Grand Central area. PW-1956, Engineering News-Record.

Civil Engineer. Twenty years experience. Highway design and municipal works. Resident and design engineer. Prefer Baltimore-Washington area. PW-2022, Engineering News-Record.

Construction Supt. or Assit. available immediately. PW-1957, Engineering News-Record.

Aggressive heavy construction executive, now employed seeking opportunity with construction firm or industry. Equally experienced in handling engineering, construction, business phases. Fine achievement record. Registered C.E., age 45, excellent health. South preferred. Reply PW-1959, Engineering News-Record.

Administrative Engineer, 34, M.S. (Civ.Eng.), M.S. (I.E. & Mgmt.) (Columbia University) Reg. P.E. 12 years US. and overseas experience in design supervision of construction, administration, personnel, economic and engineering reports and surveys. Legal minded. Prefer management eng. position with construction firm or top multiplant manufacturer, any location. English, French, German, Spanish, Italian. PW-1984, Engineering News-Record.

Construction Executive 28 years experience in all phases of heavy and industrial construction, power plants, chemical plants, refinery installations, buildings, locks, dams and tunnels, interested in connection with aggressive contractor in west or northwest doing lump sum contracts and promotional sales work. Estimating and pricing accurate, and construction methods current. Primary education M.E. Desirous of participating arrangement. PW-1992, Engineering News-Record.

Paving-Civil Engineer, 31, Reg. (N.Y.) experienced roads and airfields as project, resident and design engineer. Desire position with heavy construction contractor, East. Broad opportunity. Present salary over $9,000. PW-1981, Engineering News-Record.

POSITIONS WANTED

Electrical Engineer: Fifty-four years old, married, no children, health perfect, free to travel. Over thirty years experience many phases electrical business, design, estimating, supervision. Prefer work with contractors or builders, no electronics or 100% board work. Lettering fair. Can design for draftsman to do final lettering. PW-2021, Engineering News-Record.

Highway Engineer—Reg. P.E.—25 yrs. appropriate experience—seeks high level job in consultant's Highway branch. Reply PW-1960 Engineering News-Record.

Overseas Position Wanted—Civil Engineer, age 37, experienced as Resident Engineer and Assistant Superintendent on steam power plants, dams, heavy construction. Six years on foreign assignments. PW-1976, Engineering News-Record.

POSITIONS WANTED

Experienced Architects Superintendent desires responsible position where ability to co-ordinate trades, prepare estimates, interpret plans, etc., liaison with owner and contractors, can be depended up on in absence of the architect. Good character and work references. PW-9015, Engineering News-Record.

Sewer Foreman. Broad experience, capable to handle satisfactorily the most intricate sewer job for the contractor who seeks without constant personal guidance. Middle Atlantic area. PW-2012, Engineering News-Record.

WORK WANTED

Drafting subcontracts wanted. Work performed under direction and supervision of professional engineers Box 1127 Church St. N.Y. 8.

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES — **EQUIPMENT - USED or RESALE**

UNDISPLAYED —RATES— DISPLAYED

$2.10 a line, minimum 3 lines. o figure advance payment count 5 average words as a line.

BOX NUMBERS count as one line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

The advertising rate is $23.60 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches—to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

Send NEW ADVERTISEMENTS or Inquiries to Classified Advertising Div. of Engineering News-Record, P. O. Box 12, N. Y. 36, N. Y.

EARTH BORING MACHINES . . our business

We manufacture Sterling Hydraulic Control Earth Boring Machines in sizes and models to fit your job and budget.

Sterling Model "A" for heavy duty work
Sterling Enterpriser, 6 cylinder model
Sterling Enterpriser, 4 cylinder model
Sterling Prospector, built for REA and telephone work

Complete parts are available for Sterling, Jaques and other make earth boring machines. We completely rebuild and repair all makes diggers in our well equipped shops.

SALES SERVICE ANY WHERE IN NATION

WYOMING VALLEY EQUIPMENT DIV.

714 WYOMING AVE. KINGSTON, PA.

Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details.

GEO. E. DEATHERAGE & SON CONSTRUCTION CONSULTANTS
P.O. Box 921 Lake Worth, Florida

FOR SALE

Michigan T 6 K—truck crane, cabin and drag combination
200 D—pumpcrete complete with 8" pipe.

G. A. COONEY,
2128 Hudson Chicago 14, Ill.
Financial 6-0456.

FOR RENT

2—80D Northwest Shovels
20—Euclids—Rear and Bottom Dumps
3—DW 21 Cat Scrapers
7—D-8 Cat Dozers

N. R. CORBISELLO, INC.
P. O. Box 45, Binghamton, New York
4-1107

WANTED

In the market for Backhoe Attachment and lagging for Model 6 Northwest shovel. Interested in Pipe Laying Attachment for D-8.

L. G. DeFELICE & SON INC.
Nettleton Ave. North Haven, Conn.
C/O HARRY TALAMELLI

10 ton Niles overhead crane.

Cab operated D.C.
108' runway 33' span.
$9000

New York City phone Ravenswood 9-6050

WANTED

¾ YD. LIMA SHOVEL
Must be late model in excellent condition

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. Gladstone 5-3658

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-third year.
WILSON *Engineering Corp*
College House Offices HARVARD SQ. CAMBRIDGE MASS.

WANTED

High Gantry for Lorain 80.

AGNEW-JOSEPH COMPANY
Ronceverte, West Virginia

CRANES FOR RENT

CRAWLERS — Capacities to 80 tons, Booms to 180 ft.
TRUCK CRANES — Capacities to 35 tons, Booms to 130 ft.

P and H. Lima and Manitowoc.
Top-Condition erection cranes

ROGER SHERMAN
CRANE SERVICE, INC.
East Hartford, Connecticut JAckson 8-4106

MANITOWOC

Model 4500 Dragline. 120-ft. Boom. Caterpillar Diesel Engine. New 1953. Excellent Condition. Serial No. 4600 Series.

PRICE $129,000.00

ANDERSON EQUIPMENT CO.
Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

EUCLIDS

Used 13 yd. bottom dumps
Cummins & General Motors Powered
Located - Texas - Pa. - N. Y. State
Write, Wire or Phone
L. B. SMITH, INC.
Camp Hill, Penna.
Tel: **Harrisburg, Regent 7-3431**

LOW COST INSTALLATION AND OPERATION

CABLEWAYS

IMMEDIATE SHIPMENT
ELECTRIC, STEAM or DIESEL
CAPACITIES TO 20 TONS
SELL, RENT or BUY
AMBURSEN DAM CO. INC.
295 MADISON AVE. NEW YORK

PIPE

Surplus New & Used
FOR SALE

PIPE

VALVES and FITTINGS
All Sizes in Stock
NEW—USED
GREENPOINT IRON & PIPE CO. INC.
Bogart and Stagg Streets Brooklyn, N.Y.

PILING · PILE FITTINGS · PIPE
CULVERTS · VALVES & FITTINGS
SPECIALISTS IN PRE-FAB. PIPING

ALBERT
PIPE SUPPLY CO., INC.
Berry at North 13 Sts., B'klyn, N. Y.

ALBERT PIPE SUPPLY

DON'T WAIT

WF-H BEAMS
PILE SECTIONS
NEW · USED · IN STOCK

8" B P	36#	19/35'
10" B P	42#	45/50'
12" B P	53#	60/65'
14" B P	73#	60/65'
14" B P	89#	60/65'

We are also interested in purchasing your surplus material.

We assure you our prices will be the best obtainable.

Call **HY DRACHMAN**
STEEL CORPORATION
14-23 34th Ave., Astoria, N. Y.
Phones: AStoria 8-4484 8-8023

FOR SALE or RENT—EASY TERMS
Rebuilt—A 1 Condition
488 Bucyrus Erie Shovel 2 cy Diesel
Northwest Model Shovel, 1½ cy
Comb. Caterpillar D8 & 80 Scraper
10 ton Buffalo Springfield Gas Roller
International Vibro-Tamper
WILLIAMS CONSTRUCTION COMPANY
Box 145 Balto. 20, Md. Murdock 6-6600

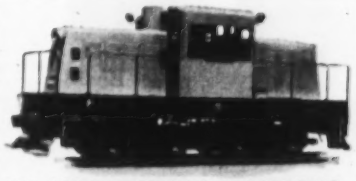
FOR SALE

5—TS-300 AC Scrapers, 275 H.P. Cummins

1—HD-19 AC Tractor, 11 ft. GW Bulldozer

1—621-S Page Dragline, 125 ft. Boom, 7 Yd. Bucket

REID-HOLCOMB CO., INC.
1815 Kentucky Avenue
Indianapolis 21, Ind.
Phone Day & Night ME(Irose) 2-4433.



50 T. PORTER DIESEL ELECTRIC LOCOMOTIVE, new '41, ser. #7300 cl; 150 HP Cummins Engines (total 300 HP) used 1 yr; excellent condition $19,750
DIESEL ELECTRIC LOCOMOTIVES, & locomotive cranes, 25-45-50-65-80-105 tons.
Tel. EDison 4-9471-2
EVEREADY: PO Box 638; BRIDGEPORT, CONN.

YOUR OPPORTUNITY!

UNUSED Army Trucks

2½, 3½, 5-ton

GMC-DIAMOND T & INTERNATIONAL 6x6's

- *From Government Storage!*
- *Unused and Guaranteed!*
- *Factory-New Condition!*
- *Delivered on Approval!*
- *Reconditioned Trucks Also Available!*

Tandem axle trucks with front wheel drive, 10 forward speeds, overdrive, brand-new mud and snow tires. Carry maximum loads, give extra power you need in "rough going" . . . at LESS, often half the COST of conventional new trucks.

For Specifications, Prices, Delivery:
Phone Collect
MILTON Y. TOOMBS, Jr.
Sales Manager

MEMPHIS EQUIPMENT Company
CONSTRUCTION AND AUTOMOTIVE EQUIPMENT AND PARTS
766 SO. THIRD ST. MEMPHIS, TENNESSEE

4500 MANITOWOC DRAGLINES

All 120' Booms, 5 Yd. Buckets

1—One Month Old
1—Six Months Old
2—1954 Machines
1—1953 Machine
1—1951 Machine

All powered with Caterpillar D-386 Engines

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

CONCRETE MIXER TRUCKS

Monthly rentals,
yardage contracts and sales
CONSERCO CO.
5224 River Road Washington 16, D. C.
Oliver 4-2011

FOR SALE or RENT

25 ton Ohio Diesel Loco. Crane new 1947.
30 ton Browning Diesel Loco. Crane. 1947.
40 ton Ind. BH. Steam Loco. Crane. 1942.
25 ton American Stiffleg. 100' Bm.
30 ton American #2 Guy Derrick. 90' Bm.
140 HP 2D Diesel Hoists 15000# SLP.
110 HP Amer. 3D #100 Hoist w/Swinger.
45 ton Davenort Diesel Elec. Loco. 1942.
65 ton Whitcomb Diesel Elec. Loco. 1945.
1½ yd. Northwest #6 Diesel Crane New 1948.
1½ yd. Bucyrus Erie 38B Diesel Crane. 1948.
60 ton Manitowoc 3900 Erection Crane. Rent.
100 HP Lucey Portable Boilers. 200# WP.

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St. St. Louis 1, Mo.

FOR SALE
Save On Good Used
WOOD ROADMIXERS

1—Model 42
2—Model 54
1—Cement Bulker for Cement Stabilization
1—Cement Transfer Screw

CLYDE W. WOOD & SONS, INC.
P. O. Box 620
North Hollywood, Calif.

SIX 22 TON REAR DUMP USED EUCLID TRUCKS

Four Model 46TD;
Two Model 36TD
All machines new 1954 and 1955

Equipped with 300 H.P. Cummins Diesel Engines. Immediately available subject to prior sale or disposition, Massena, N. Y.

L. B. SMITH, INC.
357 W. Fayette St. Syracuse, N. Y.
Phone 75-2196

DERRICK—FOR SALE

One 25 Ton 3 Sheave Steel Stiff-leg Derrick 38' Mast 85' Boom & Bull Wheel

PRICE $2500.

Abbott Equipment Company Inc.
133 Southampton St. Boston, Mass.
Tel. Highlands 5-6200

AGSCO ENGINEERED DIESEL POWER

STATIONARY—PORTABLE—MOBILE & MARINE
New and Remanufactured
100 to 2000 HP 60 to 1500 KW
New Parts For All Engines
Write for Brochure

A. G. SCHOONMAKER CO., INC. Main Office—Sausalito, Calif., Sausalito 1600 Branch—50 Church St., N. Y. 7, N. Y., Digby 9-4350

RAILS-TIES

TRACK ACCESSORIES
NEW and RELAYING

3078 CFM INGER. RAND AIR COMPRESSOR

1—Modern Ingersoll Rand Pre2, channel valves, new 1942 used intermittently, 110 lb. pres. air compressor, cylinders 30" & 18" x 21", directly driven by 500 hp, U.P.F. 3P, 60C, 440V. synchronous motor with exciter set and cubicle type push button starter. All fine shape—located Alabama.
DARIEN CORP., 60 E. 42nd St., N. Y. 17, N. Y.

RAILS
FOR IMMEDIATE DELIVERY

NEW AND RELAYING QUALITY
TIE PLATES
FROGS SWITCHES
LIGHT RAILS
TRACK ACCESSORIES

MORRISON RAILWAY SUPPLY CORP.
814 Rand Bldg. Buffalo 3, N. Y.
MOhawk 5820

FORSYTHE EQUIPMENT CO., INC.

MANITOWOC SPEEDCRANES
RENTALS

Capacities to 70 Tons
Booms to 140 ft. and 30 ft. jibs.
Special rates on long rentals
Exeter 2-6125 37-11 Vernon Blvd.
Long Island City 1, New York

MANITOWOC Stripping Shovel

Model 3500 with 45-ft. Boom 34-ft. Stick, 2 Yd. Dipper. Caterpillar D-17000 Diesel Engine. Serial No. 3700 Series.

PRICE $40,000.00

ANDERSON EQUIPMENT CO.
Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

NEW—RAILS—Relayers

All sizes and weights. Also frogs, switches, spikes, bolts, tie plates, contractors' and mine equipment carried in stock.

M. K. PRANK
480 Lexington Ave. New York, N. Y.
Reno, Nevada
Park Bldg. Pittsburgh, Pa.
Carnegie, Pa.

NEW AND REBUILT
STORAGE BATTERY
LOCOMOTIVES

1½ to 10 Ton — 18" to 56" Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Pennsylvania

PUMPCRETE—FOR SALE

200D Pumpcrete with 400 ft. 8" Pipe Excellent Condition — Chicago Area

SPENCER, WHITE AND PRENTIS, INC.
10 East 40th St. New York, N. Y.
Murray Hill 9-1530

RAILROAD Cross and Switch TIES

Promptly from adequate stocks
NEW and USED *(as available)*
GILLIS & COMPANY
29 East Madison St. Chicago 2

FOR SALE
DIESEL ELECTRIC LOCOMOTIVES

STANDARD GAUGE

25 - 35 - 40 - 50 - 65 - 75 - 100 tons

Write for Details

FRANK M. JUDGE & CO., INC.
7010 Empire State Building
New York 1, N. Y.

MANITOWOC 2000B CRANE

60' Boom, 30' Jib, Equipped

For Hook, Clamshell, Dragline Work
Cummins Diesel Engine
Good Condition

Location—Working Bridgeport, Conn.
Price $15,000

Cayuga Foundation Corporation
30 Vesey Street
New York 7, N. Y.

RAILS
NEW — RELAYING — TRACK ACCESSORIES
MIDWEST STEEL CORP.
502 DIVISION STREET
CHARLESTON W. VA
IMMEDIATE DELIVERY

RAILS—New & Relaying from Largest Warehouse Stocks in U.S.

LB FOSTER co.
PGH. 30 • N.Y. 7 • CHI. 4 • ATL. 8 • HOUST. 2 • L.A. 5

AIR COMPRESSORS

I-R; Model KAC-16; Cap. 210 C.F.M. @ 100 Lbs. Serial # 40G-37652 (1949) Waukashaw Gasoline Eng. Model # 140 GS; Mounted on Cats; Self Propelled by Air Motors; Wt. 9000 Lbs. Used very little; 95% new. Illustration available.

Davey; Model 105VD6; Series 08; Serial 2V62053; Hercules Eng. Model # QXD5; Actual Cap. 165 C.F.M. @ 100 Lbs. Skid Mounted; Late Type; Less than 100 Hrs. use; Photo available.

I-R; Type 40; Model 210; Cap. 210 C.F.M. @ 100 Lbs. Two Stage; Air Cooled; Portable; Waukashaw Eng. Older Model; Rebuilt; Photo available.

I-R; 3½"x3½"x1¾"x¾"x2½"; 3000 P.S.I. Eng. Driven.

I-R; (2) 105 C.F.M. @ 100 Lbs. mounted on 4 wheel pneumatics.

C. G. WYATT MACHINERY CO.
24th St. and Hayes Ave., Camden 5, N. J.

FOR SALE or RENT

1—Full Revolving Electric Gantry Crane, 440-60-3
1—Full Revolving Steam Gantry Crane, 40 tons capacity
1—Full Revolving Steam Crane 60 tons capacity, for barge or gantry mounting
1—955-A P&H Diesel Crane, with Fairlead, only 400 hrs.
2—250' Car Floats or Barges
1—lot of Blaw-Knox Steel Forms like new, suitable for dams or walls
1—Steel Stiff Leg Derrick, 25 tons capacity, 80' boom. Complete with electric hoist.
4—100 ton—5-sheave Derrick or Crane Blocks with Shackle, and with Cheek Weights, reasonable.
4—50 ton—4-sheave Blocks with Shackle, with or without weights.
2—Steel Barges 210' x 55' x 10'.
20—Pontoon Float Bridges 5' x 5' x 7'

WILLIAM P. SWIFT
P. O. Box 174 Springfield, Pennsylvania
Swarthmore 6-8999

2400 LIMA DRAGLINES & SHOVELS

2400 Lima Dragline, 120' Boom
3—6 Yd. Buckets, Hamilton Diesel Engine

2400 Lima Dragline, 110' Boom
2—6 Yd. Buckets, Hamilton Diesel Engine

2400 Lima High Lift Shovel, 67' Boom, 50' Stick, 4 Yd. Dipper, Cat D-397 Diesel Engine

Also, Standard 6 yd. Shovel Front Attachment for 2400 Lima and

5—½ Standard Shovel Front Attachment for 4500 Manitowoc

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

PAVEMENT BREAKER

"Mighty Midget" Air Operated on Pneumatic Tires. Excellent Condition.
PRICE $1,000.00

ANDERSON EQUIPMENT CO.
Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

FOR SALE or RENT

1—25 Ton Bay City Truck Crane, 95' Boom, New 1952.

B. M. WEISS CO.
Girard Trust Bldg. Philadelphia 2, Pa.

FOR SALE

Lima Model 802 Crane-Dragline

Model D-17600 Caterpillar Engine, Oversize cats, full accessories.

George A. Bass Construction Co.
Birmingham, Michigan

PILING

SURPLUS NEW and USED For Sale or Rent

LOCOMOTIVES

We own and offer
Subject to prior sale

2—80 ton WHITCOMB diesel electric, 650 HP, new 1944

2—45 ton PORTER diesel electric, 300 HP, new 1942

Full data and prices on request.
May be inspected in operation.

PAN AMERICAN ENGINEERING COMPANY
P. O. Box 1709 Tel. LOgan 8656
Dallas, Texas

STEEL SHEET PILING

AVAILABLE FOR PROMPT SHIPMENT

Pcs.	Section	Length	Location
100	M-115	60'	Chicago
210	M-116	29 to 30'	Colorado
190	M-115	16 to 20'	Kansas City
125	M-112	12 to 18'	Kansas
100	M-116	19 to 24'	Arkansas
100	M-116	19 to 22'	Iowa

CONMACO PHONE DRexel 1-3930

CONTRACTORS MACHINERY COMPANY
804 KANSAS AVE., KANSAS CITY, KANSAS

We do a Nation-Wide business in

STEEL SHEET PILING

IMMEDIATE SHIPMENT

Carn. MP-112—Shipped New, Used One Job
574 pcs. 35-34 ft.
723 pcs. 33-32 ft.
407 pcs. 31-30 ft.
Kentucky Shipping Point.
170 pcs. 60 & 50 ft. Carn. MP-115—Illinois.
212 pcs. 40-30 ft. Carn. MP-116—Alabama
189 pcs. 20 ft. Inland I-27—Tennessee
250 pcs. 20 ft. Carn. MP-112—Texas
Other Lengths & Sections at Various Locations

PILE DRIVING EQUIPMENT

Vulcan and McKiernan-Terry Steam Pile Hammers and Extractors Hoists and Boilers

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St., Chestnut 1-4474, St. Louis, Mo.

FOR SALE

6' x 22" Hardinge Conical Ball mill
Rotary Steam Tube Dryer—4' x 20'
Rotary Hot Air Dryer—3' x 24', 4'6" x 40', 5'6" x 50', 4'6" x 32'.
8" x 10" Sturtevant Jaw Crusher
Hoists, Cranes, Conveyors

We pay for your surplus; send us your listings

PERRY EQUIPMENT CORP.
1410 N. 6th St. ST 4-7210
Phila. 22, Pa.

STEEL SHEET PILING
178 TONS CARNEGIE MP 115—21' & 25'
900 TONS BETH. DP2 & AP5—30', 40' & 60'
222 TONS INLAND 127—40'
25 TON LOCO CRANE
1—AMERICAN DIESEL 50' BOOM
E2 PILE EXTRACTOR
1 McKIERNAN TERRY E2
R. C. STANHOPE, INC.
60 E. 42nd St., N. Y. 17, N. Y.

LARSSEN SHEET PILING

WESTERN SERVICES CORPORATION
representative of SIDELOR FRANCE
601 E. Linden Ave., Linden, N. J.
HUnter 6-4000
STOCK AVAILABLE IN LINDEN, N. J.

RENT STEEL SHEET PILING

Get the exact lengths and sections you need of all standard sections, delivered *on time*—and at Foster's usual low rental rates

H-BEARING PILE
PIPE FOR PILING
LIGHT-WEIGHT STEEL PILING
PILE HAMMERS & EXTRACTORS

L.B. FOSTER Co.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

FOR SALE

Super "C" Tournapulls W.L.P. Scraper Wafons in very good condition & Excellent rubber at a very attractive price.
Also 25 Ind. Brownhoist R.R. Pile Driver on std. gauge R.R. car.

M. W. LACH CA.
300 Turnpike St. Canton, Mass.

WANTED TO BUY
STEEL SHEET PILING
DIESEL LOCOMOTIVES
ROTARY DRIERS AND KILNS
ELEC. DRIVEN AIR COMPRESSORS
R. C. STANHOPE, INC.
60 E. 42nd St., N. Y. 17, N. Y.

PROFESSIONAL SERVICES

NEW ENGLAND

Jackson & Moreland, Inc.
Engineers and Consultants

Design and Supervision of Construction

Reports — Examinations — Appraisals

Machine Design—Technical Publications

Boston — New York

Metcalf & Eddy
ENGINEERS

Investigations — Reports — Design
Supervision of Construction and Operation
Management — Valuation — Laboratory

1300 Statler Building, Boston 16

MIDDLE ATLANTIC

Greer Engineering Associates
SOIL MECHANICS

Foundation Designs and Analyses
Airphoto Soils and Geological Mapping
Undisturbed Sample Borings
Field and Laboratory Soil Tests
Geological Studies for Engineering Projects.
Earth Dam Design and Control

98 Greenwood Ave. Montclair, N. J.

Edwards, Kelcey & Beck
Consulting Engineers

Reports, Design Supervision
Subways, Expressways, Traffic, Parking
Harbor Works, Bridges, Tunnels
Housing and Industrial Developments

Newark, New Jersey
New York — Philadelphia — Boston

Porter, Urquhart, McCreary & O'Brien
O. J. Porter & Co.
CONSULTING ENGINEERS

Airports—Highways—Expressways—Buildings—Bridges—Dams—Harbors—Foundations—Stabilization—Pavements
Reports, Designs & Supervision

415 Freilinghuysen Ave., Newark 5, N.J.
615 Eighth Avenue, New York 18, N.Y.
3568 W. Third St., Los Angeles 5, Cal.
503 Market St., San Francisco 5, Cal.
516 Ninth Street, Sacramento 14, Cal.

John Clarkeson
Consulting Engineer

Civil Engineers — Consulting Services

Highways, Airports, Bridges
Surveys, Waterfront Facilities

Albany and Watertown, N. Y.

Lockwood, Kessler & Bartlett, Inc.
Engineers — *Surveyors*

Civil Engineering Investigations, Reports and Designs, Supervision of Construction, Cadastral, Geodetic, Topographic & Engineering Surveys, Photogrammetric Engineering and Mapping
One Aerial Way — Syosset, N. Y.

Ammann & Whitney
Consulting Engineers

Design and Supervision of Construction of Bridges, Highways, Expressways, Buildings, Special Structures, Airport Facilities

111 Eighth Ave., New York 11, N. Y.
734 E. Mason St., Milwaukee 2, Wisc.

E. Lionel Pavlo
Consulting Engineer

Design, Supervision, Reports
Bridges, Highways, Expressways
Marine Structures, Public Works
Industrial Construction, Airports

7 E. 47th St. — New York 17, N. Y.

D. B. Steinman
Consulting Engineer

BRIDGES
HIGHWAYS

Design, Construction
Strengthening, Investigations,
Reports, Advisory Service

117 Liberty St., New York 6, N. Y.

Severud-Elstad-Krueger
Consulting Engineers

Structural Design - Supervision
Reports - Buildings - Airports
Special Structures

415 Lexington Avenue
New York 17, N. Y.

Robert W. Lowry
Consulting Engineer

Robert W. Lowry — M. Lepkaluk
Design, Supervision, Reports, Long Span & Movable Bridges, Expressways, Highways, Airports, Prestress Design, Stress Analysis. 227 Pine, Harrisburg, Pa. 122 E. 42nd St., N. Y. P.O. Box 1141, 18 N. 8th St., Richmond, Va.

Michael Baker, Jr., Inc.

Consulting Engineers, Civil Engineers, Planners & Surveyors; Airports & Highway Design; Water Works & Sewerage Design & Operation; Aerial Topo Maps; Surveys; Reports & Investigations; Irrigation. Home Off.—Rochester, Pa. Br. Off.: Jackson, Miss.; Harrisburg, Pa.; College Park, Md.

Sprague & Henwood, Inc.
Drilling Services

Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling & Pressure Grouting, Diamond Core Drilling

221 W. Olive Street, Scranton, Pa.
1009 Western Savings Fund Bldg., Philadelphia, Pa.
11 W. 42nd St., New York, New York
200 Magee Bldg. Pittsburgh, Pa.
Box 645—Grand Junction, Colorado
Buchans, Newfoundland

Buchart Engineering Corp.
Engineers

Highways — Bridges — Toll Roads
Sewerage — Industrial Waste and Disposal — Water Works — Surveys — Reports — Design — Supervision — Consultation — Industrial — Municipal — Structures

611 W. Market St., York, Pennsylvania

SOUTH

Duval Engineering & Contracting Co.
General Contractors

FOUNDATION BORINGS
For Engineers and Architects.

Jacksonville — Florida

Rader and Associates
Engineers - Architects

Sewage Disposal, Water Works, Ports, Airports, Bridges, Hi[illegible], Office and Commercial Buildin[illegible], Industrial Plants. Reports, Investigations, Consultations.

111 N.E. 2nd Avenue, Miami 32, Fla.

MIDDLE WEST

Consoer, Townsend & Associates

Water Supply, Sewerage, Flood Control & Drainage, Bridges Express Highways, Paving, Power Plants. Appraisals, Reports, Traffic Studies, Airports, Gas & Electric Transmission Lines.

351 East Ohio St., Chicago 11, Illinois

Toledo Testing Laboratory
Engineers—Chemists

Concrete — Soils — Asphalt
Inspection — Research
Tests — Development
Foundation Investigation
Borings — Diamond Drilling — Load Tests
Soils Mechanics Laboratory

1816 North 13th St. — Toledo 2, Ohio

GEOLOGISTS

Geologic Associates
ENGINEERING GEOLOGISTS

Studies and Reports
Foundation Investigations
Specialized Drilling and Sampling

1500 8th Ave. So. — Nashville, Tenn.
9-1519 — Phones — 5-4402

INSPECTION & TEST

A. W. Williams Inspection Co.

Established 1921—Member A.C.I.I.
Inspection—Testing—Analyses—Supervision. Foundation Investigations, Soil Borings, Soil Mechanics, Concrete and Asphalt Design and Control, Radiography, Sampling, Calibrations, Timber and timber treatment Inspections, Complete testing laboratory service.

Main Office: 208 Virginia St., Mobile, Ala.

The Haller Testing Laboratories, Inc.

Testing and Inspection of Construction Materials for: Expressways—Airports Structures—Bridges

Complete Soils Laboratory

Borings—Drilling—Load Tests

801 2nd Ave., N. Y. 17, N. Y.
Boston, Mass.
Plainfield, N. J. — New Haven, Conn.

Consult these Specialties

Let them save your time by bringing their broad experience in their specialty to bear on your problems.

SEARCHLIGHT SECTION

(Continued from preceding page)

SURVEYING INSTRUMENTS

USED • REBUILT • SALE • RENT • REPAIRING

TRANSITS AND LEVELS

New or Rebuilt Sale or Rent

Headquarters for REPAIRS — any make — Factory Service. We will also buy your old instruments or take them in trade.

A complete line of Engineering Instruments and equipment for field or office. Write for Catalog NRL 66.

WARREN-KNIGHT CO.
Manufacturers of Sterling Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

---

expert repairs

or complete overhauling by skilled craftsmen on all makes and types. Precision guaranteed.

FINE RENTAL INSTRUMENTS

Reasonable rates, on monthly or yearly basis. All instruments guaranteed to be in first class condition.

David White COMPANY
319 W. Court St.
Milwaukee 12, Wis.

TRANSITS & LEVELS
Various Makes
NEW & REBUILT

Fully equipped modern shops — all makes and models repaired — all work guaranteed — prompt service — complete line field supplies.

INSTRUMENTS RENTED

Midwest Representative: W. & L. E. Gurley

NATIONAL BLUE PRINT CO.
Established 1914
210 S. Canal St. — Chicago (6), Ill.

SPECIALIZED REBUILDING
of surveying and engineering instruments.
All makes and models expertly repaired in modern shop. All work guaranteed.
Distributors for Brunson Instruments
Hickerson Instrument Co.
8 North Edmondson Avenue, Indianapolis 19, Indiana

REBUILT REPAIRS RENT REAL EXPERTS

BUFF — ALL MAKES

69 Day St., New York — WOrth 2-2797

New "Searchlight" Advertisements

received by June 18th will appear in the June 28th issue subject to limitations of space available. Address copy to the *Classified Advertising Division*
ENGINEERING NEWS-RECORD
P.O. Box 12, New York 36, N. Y.

ADVERTISERS IN THIS ISSUE

Acker Drill Co. 121
Aetna Casualty & Surety Co. 114
Allis-Chalmers Mfg. Co., Machy. Div. 92, 93
Aluminum Co. of Amer. 59
Amer. Bitumuls & Asphalt Co. 91
Amer. Cable Div., Amer. Chain & Cable Co. 9
Amer. Foreign Ins. Assoc. 72
Amer. Steel & Wire Div., U. S. Steel Corp. 14, 15
Armco Drainage & Metal Prod., Inc. 52
Asphalt Institute 50, 51

Bakelite Co., Div. U. C. C. 4, 5
Belmont Iron Wks. 116
Bethlehem Steel Co. 87
Blood Bros. Machine Co. 122
Bruning Co., Inc., Charles 49
Butler Bin Co. 119
Byers Co., A. M. 2nd cover

Caterpillar Tractor Co. 30, 31
Ceco Steel Prod. Corp. 60, 61
Celotex Corp., The 109
Champion Mfg. Co. 39
Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div. 141
Concrete Grinding Corp. 112
Concrete Reinforcing Steel Inst. 97
Construction Machinery Co. 123

Detroit Diesel Engine Div., G.M.C. 132, 133
Dicalite Div., Great Lakes Carbon Corp. 38
Dodge Div., Chrysler Corp. 43
Dresser Mfg. Div., Dresser Ind. 75
Dudgeon, Inc., Richard 104

Eastman Kodak Co. 85
Economy Forms Corp. 114
Erie Strayer Co. 65

Fairbanks-Morse Co. 118
Fennel Instrument Corp. of Amer. 84
Filotecnica Salmoiraghi Inc. 126
Fireman's Fund Ins. Co., National Surety Corp. 124
Freyssinett Co. 35

GarBro Mfg. Co. 10
Gar Wood Ind., Inc. 67
General Electric Co., Electronics Dept. 105
General Electric Co. 70, 71
Goodall Rubber Co. 42
Goodyear Tire & Rubber Co. 18
Graphic Systems 129
Griffin Wellpoint Corp. 118
Gunite Concr. & Const. Co. 122
Gurley, W. & L. E. 114

Hamilton Kent Mfg. Co. 29
Hendrix Mfg. Co., Inc. 110
Hercules Motors Corp. 125
Hetherington & Berner, Inc. 116
Hope's Windows, Inc. 58
Hose McCann Telephone Co., Inc. 108

Imperial Pencil Tracing Cloth 108
Inland Steel Prod. Co. 111
Insurance Co. of North America 99

International Harvester Co. 77-82
International Harvester Co., (Trucks) 101
Intrusion-Prepakt, Inc. 55
Irving Subway Grating Co. 12

Johns-Manville Corp. 94
Joy Mfg. Co. 115

Kern Instr. Co. 120
Klemp Metal Grating Corp. 121

Layne & Bowler, Inc. 118
LeRoi Co. 107
Lincoln Electric Corp. 56
Lone Star Cement Corp. 20

Macomber, Inc. 113
MacWhyte Co. 127
Mahon Co., R. C. 130
Manitowoc Engr. Wks. 89
Manumine Research & Dev. Co. 3rd cover
McCulloch Motors Corp. 126
McGraw-Hill Book Co. 106
McKiernan-Terry Corp. 104
Momar Ind. 129
Moretrench Corp. 100
Murphy Diesel 1

National Steel Corp., Stran Steel Div., Great Lakes Steel Co. 44
Northwest Engr. Co. 3

Olin Film Div. 13
Owens Corning Fiberglas Corp. 143

Pennsylvania Drilling Co. 116
Phoenix Bridge Co. 122
Pittsburgh Plate Glass Co. 144
Post Co., Frederick 88
Price Bros. Co. 41

Remington Arms Co., Inc. 69
Ric-Wil Inc. 102
Russell, Burdsall & Ward Bolt & Nut Co. 137
Rust-Oleum Corp. 11
Ryerson & Sons, Inc., Jos. T. 16

St. Paul & Tacoma Lumber Co. 48
Servicised Prod. Corp. 103
Skookum Co. 100
Smith Co., S. Morgan 86
Smith Engr. Wks. 32
Spencer, White & Prentis, Inc. 66
Standard Dry Wall Prod. 90
Stoody Co. 62
Stow Mfg. Co. 34
Symons Clamp & Mfg. Co. 2

Taller & Cooper, Inc. 117
Tapecoat Co. 120
Texas Co. 6, 7
Thor Power Tool Co. 8
Thurman Machine Co. 123
Timber Engr. Co. 124
Timken Roller Bearing Co. 4th cover

United Steel Fabricators, Inc. 76
Universal Mfg. Co. 134

Vibro-Plus Prod., Inc. 68
Vickers, Inc., Div. of Sperry Rand Corp. 138
Vulcan Iron Wks. 100

Water Seals, Inc. 95
Weil Pump Co. 54
Wisconsin Motors Corp. 104

Zonolite Co. 64

Professional services 156

CLASSIFIED ADVERTISING

F. J. Eberle, Business Mgr.

Employment Opportunities ... 148-152
Educational 152
Proposals 145-148
Equipment (For Rent, Sales Wanted) ... 152-156

ENGINEERING NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000

ABP Member

Number of copies of this issue printed, 73,329

D. S. Robertson, Advertising Manager
Donald J. Cassidy, Business Manager

ADVERTISING REPRESENTATIVES

New York, 36—330 W. 42 St.,
C. D. Neulen, H. T. Olsen
J. White

Chicago, 11—520 No. Michigan Ave.,
L. H. Hunt, W. G. Payne

San Francisco, 4—68 Post St.,
J. W. Otterson, R. C. Alcorn

Philadelphia, 3—17th and Sansome Sts.,
D. G. Jensen

Cleveland, 15—Hanna Bldg.,
E. E. Duff, Jr., F. P. DiToro

Detroit, 28—Penobscot Bldg.,
J. A. Houghton

St. Louis, 8—Continental Bldg.,
B. F. Horn

Los Angeles, 17—1125 W. Sixth St.,
H. L. Keeler

Atlanta, 3—Rhodes-Haverty Bldg.,
W. D. Lanier

Dallas, 2, Adolphus Tower Bldg.,
G. Jones, D. C. Billion

OTHER SALES OFFICES:

Pittsburgh, 22—919 Oliver Bldg.,
Boston, 16—350 Park Square Bldg.,
London, McGraw-Hill House

Foreign Aid Is Self Help

BECAUSE CONSTRUCTION PEOPLE have played a prominent part in all our foreign aid operations since the war, they may be expected to have a well-balanced perspective of the value and necessity of this kind of national investment. Should that be the case, there is a rare opportunity for some useful missionary work on their part among their fellow countrymen, both in and outside Congress.

The fact is that if some of the statements being made about the President's foreign aid proposals reflect thinking, and not just the noise of political harassment, it is shallow and dangerous thinking, and should be challenged. And arguments are not too difficult to marshal.

At the end of the war the United States found itself in the position of world leadership. It chose not to exploit that leadership, but to use it constructively to help stricken nations to their feet—indeed to help friend and former foe alike. This thoroughly humanitarian attitude was repulsed by only one country, Russia, which not only refused to be a partner to repairing the war's devastation but chose the role of obstructionist and rival.

The result was that the survival of the United States, itself, became part and parcel of its humanitarian effort. Not only must it help the world to recover, it had to make it strong enough, quickly enough, to resist being overrun by Russia, as a preliminary to being overrun itself.

Thus was foreign aid begun. The first phase found expression in the Marshall Plan and ECA. Partly humanitarian and partly economic, it concentrated on war-damaged Europe. It succeeded in giving the European countries the facilities and the will to resist.

Blocked from peaceful, economic penetration, Russia stepped up war threats, which could only be countered with military capability on the part of ourselves and our allies. The second phase of foreign aid encompassed military assistance. That investment also paid off for, Russian war threats having failed, economic aid to underdeveloped—and strategically placed—countries is now the Russian theme.

Thus the third phase of foreign aid must be on the field of economic competition. Having won the two previous battles the United States must also win a third one, for this is a case where one lost battle loses the war. The particular distinction of the third phase is that the battleground is in Africa and Asia rather than Europe, and that Russia is seeking to advance its cause by somewhat more peaceful means than heretofore.

Because conditions are different, some changes in tools are necessary. One that the President seeks is more flexibility in making long-term commitments, which may be necessary to cover a power or water resource project, for example. Another is greater authority to place funds where he feels they will do the most good. Both these requests are in danger of being killed in Congress while, in addition, the size of the program is being cut twenty percent. Only shallow and dangerous thinking could support such a relaxation of our posture at a time when Russia is strengthening hers.

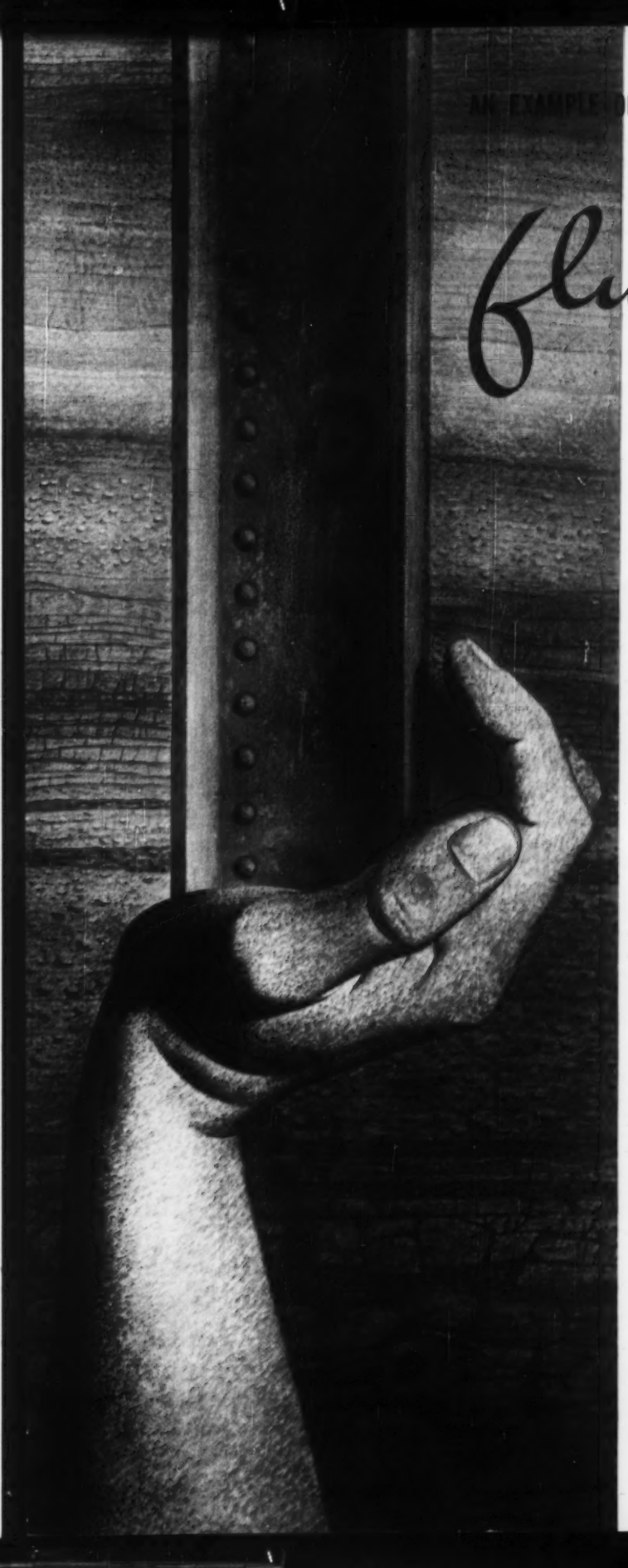
Foreign aid has never been charity. In every instance we have bought something worthwhile and essential with our money—the nation's security. Moreover, large quantities of the money have been spent in this country, contributing to our employment and profits, and even coming back to the national treasury in the form of taxes.

It would be tragic to abandon our role of world leadership at the very time when victory through peace—even armed peace—is in sight. Actually, what Russia has finally come to is what we want—competition on the economic plane for opportunities to raise the living standards of the underdeveloped parts of the world. From these can come raw materials, which we will need in increasing quantities, new markets for our products, outlets for our construction know-how, and, of overriding importance, countries dedicated to the same standards of freedom and the same ideals of democracy as we are.

Foreign aid should be called what it is—foreign investment. It is definitely not charity, and it is obviously self-help. The President should be given what he asks because it is neither extravagant nor unrealistic. Crippling his program will only cripple our efforts to assure our national security and to support our growing economy.

What's the Objective?

ALLOCATING ROAD FUNDS to the states for construction of the interstate highway system has become a point of disagreement between the House and Senate conferees trying to iron out the differences between the two bills that have been passed. The Senate favored allocation by the normal formula used for all federal aid. The House said the funds should be allocated on the basis of each state's requirements for completing its interstate system mileage. The objective of this special federal aid fund is to complete the interstate system, not to give some states more than they need, others less, which is what the normal formula would do. The House version of allocation on the basis of need is the one that makes sense, and should, therefore, be adopted.



AN EXAMPLE OF GEOLOGICAL ENGINEERING BY MANU-MINE

fluid soil

CHANGED TO **SOLID ROCK** FOR INDUSTRY TO BUILD ON

Today the soil you build on can be "specified"—much like the steel and concrete for the plant, bridge, or highway you have in mind. And not by switching your project to a new location, but by making the earth beneath *the site you have* cooperate.

The process is called *soil solidification*. Chemicals injected into sub-surface water-bearing soils—even quicksand—convert them instantly and permanently into a solid mass having the load-bearing value of native sandstone.

The men of Manu-Mine pioneered this process. It has been successfully applied to dams, tunnels, reservoirs, bridges and mines, as well as highways and buildings. It has been applied both *before* construction and *after* completion—even after damage has commenced from initially inadequate foundations.

Soil solidification is just one of the geological engineering services offered by Manu-Mine to contractors and engineers in industry, utilities, and government. Manu-Mine has demonstrated its ingenuity in tough jobs in many fields throughout the world.

We would like to send you further information on our many varied services. Just state your field of interest and we'll see that your request is handled promptly.

GEOTECHNICAL PROJECTS: Geology and geological engineering, geophysics, geochemistry, soil mechanics and soils testing.

MINING ENGINEERING: Shaft-sinking and tunnel-driving, ventilation, mine evaluation, development, roof control, fire control.

MANU-WALL CONSTRUCTION: Retaining walls, damsites, viaducts, and other construction relating to the control of water.

FOUNDATION ENGINEERING: Soil stabilization, water control, ground-bearing support.

CERAMICS: Research for the ceramic industry. Studying special problems for the brick and clay products industries.

SOIL SOLIDIFICATION: Stabilization of foundations, control of water in tunnels, solidification of fluid soils.

NUCLEAR RESEARCH: Research in radioactive waste disposal, agricultural problems and nuclear energy.

HIGHWAY DESIGN: Special studies in geology and surface stability, sub-base stability of road slabs.

RESERVOIRS: Rehabilitation and construction. Storage of liquids in open and underground pits.

MANU-MINE

MANU-MINE

Research & Development Company

Reading, Pennsylvania

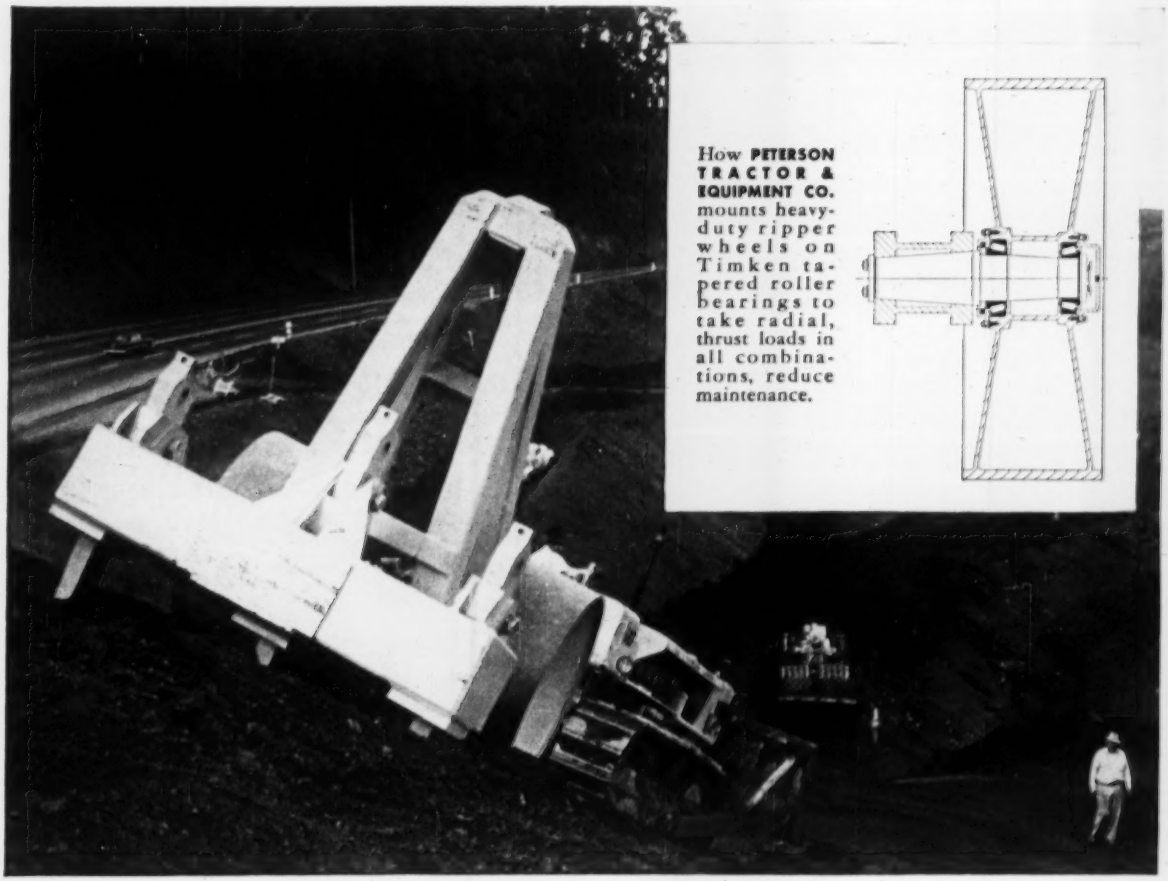
Largest, huskiest pull-type ripper ever made breaks solid rock—rides on TIMKEN® bearings

PETERSON Tractor & Equipment Company's 17-ton heavy-duty ripper does work formerly done by dynamite blast—rips dirt, shale, stone, soil, even solid rock strata, to depths up to 5 feet. Total weight of unit is about 35,000 lbs. From 1 to 6 tractors pull this ripper, depending on rockiness of soil. Steel drum wheels, 24″ wide x 60″ diameter, are mounted on Timken® tapered roller bearings.

Timken bearings, because of their tapered construction, can take radial and thrust loads in all combinations. Their geometric design gives true rolling motion, practically eliminates friction. Full line contact between rollers and races means extra load-carrying capacity. Every cup, cone, and roller is case-carburized, giving them hard, wear-resistant surfaces over tough, shock-resistant cores, to take heavy shock loads. By holding shafts and housings concentric, Timken bearings make closures more effective in keeping out dirt, dust, water, keeping lubricant in.

Timken bearings are precision-made, with quality controlled all the way from melt shop to final bearing inspection. We even make our own steel, something which no other American bearing manufacturer does. So . . . when you build or buy construction equipment, look for the trade-mark "TIMKEN" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **PETERSON TRACTOR & EQUIPMENT CO.** mounts heavy-duty ripper wheels on Timken tapered roller bearings to take radial, thrust loads in all combinations, reduce maintenance.

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

TRADE-MARK REG. U. S. PAT. OFF.